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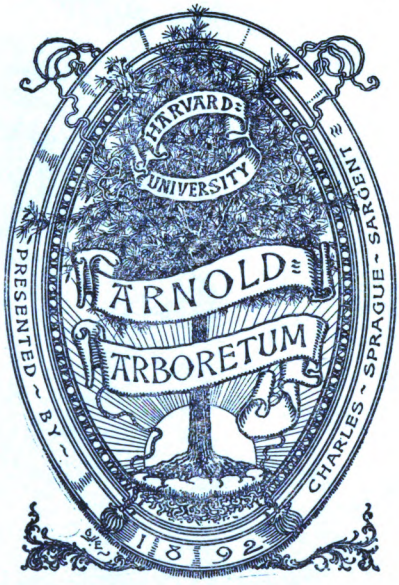

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pp. 157, 169.

THIRD BIENNIAL REPORT

FROM THE

BUREAU OF MINES,

Manufactures and Agriculture

OF THE

STATE OF ARKANSAS

FOR THE YEARS

1893 and 1894.

W. G. VINCENHELLER, COMMISSIONER.

MORRILTON, ARK.
PILOT PRINTING COMPANY.
1894.

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Morrilton, Ark.

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THIRD BIENNIAL REPORT

—OF—

Mines, Manufactures and Agriculture.

—BY—

W. G. VINCENHELLER, *Commissioner.*

OFFICE OF BUREAU, LITTLE ROCK, October 1, 1894.

To His Excellency, Gov. William M. Fishback:

SIR.—I have the honor to submit herewith the third biennial report of the Arkansas Bureau of Mines, Manufactures and Agriculture for the years 1893 and 1894.

EXHIBITS.

The bureau had quite a creditable lot of specimens of the products of the state on hand, when your commissioner took charge of the office, March 10, 1893. Considerable additions have been made to the exhibits during the years 1893 and 1894, especially in fruits, vegetables, grains, grasses and native woods. Sixty varieties of woods having been added recently. So that, notwithstanding the large drafts made on our exhibits for the World's Columbian exposition, at Chicago, in 1893, (many of which were lost or stolen, as usual, and never returned,) yet, we still have a very nice exhibit of the products of the state. These are fairly well arranged for our limited space. We could use to advantage, twice as much space as we have assigned us at present for exhibits.

STATISTICS.

It is made the duty of the commissioner to collect statistical data, in relation to the resources of the state, and methods of developing the same, and distribute this information within and without the state.

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Something has been done in this direction, but our efforts have not borne satisfactory results. There is no law nor system in Arkansas for gathering statistical information. The United States census is our only reliable source for specific informatiou as to our resources, products, growth, etc. We regard this as very unfortunate for the state at this time, when there is such a demand for reliable information in regard to our resources. It is practically impossible to obtain trustworthy facts in relation to our varied resources and industries by voluntary contributions. We have tested this method thoroughly, by circular letters, publishing calls in the newspapers, appeals to patriotism, etc., etc. We find we can not rely upon such methods for statistics. If there were hearty responses to these importunities, nothing more than estimations could be expected. Reliable data is what we need.

We would therefore recommend that the county assessors be charged with the duty of collecting statistics of the resources, products and development of each county, annually, with a penalty attached for failure to do so; for this labor they should receive remuneration. We find this to be the law in many of our most progressive and prosperous states.

There is no other interest in the state, in my judgment, of superior importance, to the collection and distribution, in convenient and attractive form, of reliable information of the resources of the state. Men seeking homes and investments have ceased to give credence to general estimates. They demand specific facts. Arkansas can give the facts, and satisfactory ones, if some efficient method of gathering them is adopted.

We have, however, been constantly on the alert, calling, time and again, on all men everywhere in the state, to assist us in presenting the wonderful resources of Arkansas to the public, at home and abroad. We have used the Uni-

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ted States mails freely in sending out the publications of this office; and whatever printed matter of a local character we could lay hands on; provided always that it appeared reliable. It would not be extravagant to say we have distributed many tons of descriptive matter of the state, in response to requests for information about Arkansas, from parties out of the state, in the last twelve months.

IMMIGRATION.

This bureau is charged with the duty of looking after and furthering the interests of mining, manufacturing, agriculture and horticulture; and, incidentally, immigration. How best to do this, under the conditions that surround us, has been the all-absorbing question. Upon the very threshold of the consideration of this question, we were confronted with the lamentable fact that the whole country was in the midst of the most severe, far reaching and disastrous money panic ever witnessed in the United States, and, perhaps, in the civilized world. In every direction, stagnation in business ruled supreme. More especially was this true in mining and manufacturing interests. Agriculture and horticulture, all honor to these pursuits, did not suffer so badly in this trying ordeal; though no industry escaped the blighting touch of this wide-spread money stringency.

We are glad to report, that in spite of this panic and labor troubles in almost every industry, agriculture and horticulture have made commendable progress in Arkansas, even beyond our most sanguine expectations. It is apparent, however, to the most casual observer, that in order to develop properly the varied resources of the state, we must have more *men* and *money* in Arkansas.

With the advice and encouragement of your Excellency, much of the energy and means of the bureau have been expended in making prominent the advantages of the state to homeseekers, thus inducing a healthy and desirable class of immigration to the state.

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Taking advantage of the World's Columbian exposition at Chicago, in 1893, as a most opportune time and place to call the attention of the millions of visitors at the fair, to the marvelous and diversified resources of the state; we left nothing undone within the range of possibility, with the limited funds at our disposal, to represent and set forth the advantages and fruitfulness of the state. To this end we spent the greater part of the year 1893, collecting and exhibiting in person, the varied products of the state at the World's Fair at Chicago.

We were the more encouraged in our efforts to induce immigration, by the unrest and discontent very apparent among the industrial classes in the north and east, with a manifest inclination to go "back to the lands" from the crowded cities and workshops. The "waters were troubled," so to speak, and we thought then, and still think, that was the opportune time and place for Arkansas to make a supreme effort to attract the attention of homeseekers and capitalists throughout the country to the rare advantages and opportunities offered here for bettering their condition. After a very careful and painstaking investigation of the resources and opportunities of the state, both to labor and capital, we want to say, without attempting an argument, the proof is abundant and conclusive, that when you take into account the mildness of our winters; the variety of our soils and products; the cheapness and fertility of our lands; the abundance and regularity of rainfall; the healthfulness of our climate; miles of navigable waters; the abundance and value of our timbers, and the richness and variety of our minerals, Arkansas presents more of the elements of success, and better opportunities for the rich and the poor, than any other section of this great country.

In this connection, we would earnestly recommend to your Excellency, the importance of some legislation, looking to some organized, systematic effort to procure desirable immigration to the state.

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THE BUREAU.

Government, in the very nature of things, is a burden. A necessary burden to be sure, but a burden, all the same.

When the cost of maintaining the usual departments of the state government is considered, the thought of any direct return, in dollars and cents, on the investment, is never entertained for a moment. These are burdens with no return, except in the way of good government and wise legislation.

When the purpose and work of this bureau is considered in its true light, as it stands connected with the development of the resources of the state, the cost of a liberal maintenance is strictly a business investment, with a certainty of direct and speedy returns, with enormous profits.

It has been truly said, "He who makes two sprigs of grass grow where only one grew before, is a benefactor to his race." In like manner this bureau, which was created solely for the development of the material wealth of the state, may become a beneficent agency, if properly fostered and regulated.

In the matter of immigration alone, during the year 1894, (which we insist was largely due to the efforts and methods put forth by this bureau), who can correctly estimate, or even approximate, the value to the state of the brain and brawn and capital that has been induced to come into the state? Would one million of dollars be an over-estimate? Why, we have the facts and figures that, in a single county, more than one hundred thousand dollars have been invested in farm lands, by actual settlers from other states, in the year 1894! We have no doubt two millions of dollars have been added to the wealth of the state by the influx of capital in 1894, notwithstanding the stringency in money matters.

Again, who can estimate the value to the state of an industrious, law-abiding citizen, if he should come to us without

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a dollar? We will not undertake to put an estimate upon him, except to say he is invaluable. He and his like are the main hope of the state and society. He fights the battles of his country, pays the taxes, clears up the lands, opens the mines and keeps the wheels of the manufacturers going.

If we have had one purpose above another, within the scope of our duty, it has been to seek out and strive to induce good citizens to come among us and locate on our unoccupied lands.

We are gratified to be able to report that never in the history of the state were there so many home-seekers from other states in one year as in 1894.

STATE LANDS.

The State of Arkansas owns and holds about 1,000,000 acres of public land. These lands are to be found in every county in the state, more or less.

About four-fifths of the public lands, owned by the state, are subject to donation—a kind of state homestead law—which we publish herewith for the information of home-seekers.

For $10.50 cash, a donation entry may be made on 160 acres or less, of these state lands, which sum is in full of all charges by the state. A most easy and cheap way of getting a home.

There is no distinction in the methods of entry and purchase, between agricultural and mineral state lands.

State lands are classified as follows:

	No. acres.
Quantity passed through overdue tax-suits, act of 1881, subject to donation or sale at $1.25 per acre	290,160
Forfeited lands, subject to donation or sale at $1.25 per acre	681,800
Swamp lands, for sale at $1.25 per acre	53,870

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Internal improvement lands, for sale at $1.25 per acre	26,893
Seminary lands, at $1.00 per acre	514
Saline lands, at $1.25 per acre	11,415
Real estate bank lands, sold at their appraised value	5,988
Total number of acres	1,070,640

The following brief summary revised by C. B. Myers, commissioner of state lands, will answer all questions how to obtain them otherwise than such as arise after a personal inspection of the parcel of land sought to be secured.

None except the lands forfeited for taxes are subject to donation.

In no case can more than 160 acres of land be donated to one person.

Applicants for donation simply apply for whatever right the state may have in and to the land desired, and the fee is for service rendered and not in payment for the land. The state gives a *quit claim* to the land, on the condition that it be improved, occupied and cultivated by the donee.

Forfeited land is subject to sale at $1.25 per acre. Sixty per cent of the amount may be paid in county script (of the county in which the lands are situated,) and the remaining forty per cent in state script or currency or certificate of indebtedness, or the whole amount may be paid in state script or currency.

Internal improvements, saline and swamp lands are sold at $1.25 per acre.

Seminary lands are sold at $1.00 per acre.

Bank lands are sold at the appraised value.

All sales are for cash. The purchase money and fee must be paid into the state treasury before a deed can be issued from this office.

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Forfeited lands come to this office by deeds or certificates from the county clerks, in which many errors occur, many of which are detected and corrected in this office, while others are of such a nature that it is impossible for the commissioner to detect them—as in cases where persons hold receipts for the taxes paid for the same year reported forfeited, and where the United States homestead entries are reported forfeited before the land becomes taxable. Where persons purchase *forfeited* lands, and the forfeiture afterwards proves to be an error, the purchase money cannot be refunded, as the legislature made no appropriation for paying such claims.

The courts have sustained tax titles where the land was subject to taxation at the date of forfeiture, and where the forfeiture was taken in conformity with law; for this, applicants must look out for themselves.

The commissioner will not suffer any one to take up lands that are shown by the records to be erroneously forfeited; but, as stated above, the records do not show *all* the errors that exist. Applicants should acquaint themselves with the history of the land desired before paying out any money, or doing any work on the same.

A donation cannot be floated from one tract to another. Applications cannot be received, or money taken on deposit, in anticipation of lands which are expected thereafter to become subject to entry at the state land office. The law prohibits the commissioner doing anything which would have a tendency to give one citizen the advantage of another in procuring state lands.

Donees cannot legally *sell* any part of their donations, or *cut* or *remove* any timber therefrom, except for the specific improvement of such donation, until the *deed* is issued therefor.

The following fees are required by law to be certified by the commissioner, and paid into the state treasury direct,

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for the use of the state and *cannot* be refunded under any circumstunces.

For each certificate of donation	$10 00
For each deed or patent of any description	1 00
For each certificate (other than a donation)	1 00
For each affidavit (made before the commissioner)	50
For copy of field notes of any section	1 00

A tender to the state treasurer of the requisite amount of money, including the fee, is necessary to constitute a legal application to obtain state lands through the state land office.

Every facility is afforded for the inspection of these lands.

DONATION LAW NOW IN FORCE.

APPROVED APRIL 4, 1887, AND THE ACT AMENDATORY THEREOF, APPROVED MARCH 3, 1891, AND MARCH 7, 1893.

AN ACT FOR THE DONATION OF FORFEITED LANDS.

Be it Enacted by the General Assembly of the State of Arkansas:

SECTION 1. The right of the state to all lands other than town and city lots, which have been or may hereafter be forfeited to the state for the non-payment of tax, penalty and cost due thereon, and remaining in the office of the commissioner of state lands, subject to sale, may be donated to any person who is the head of a family, or who has arrived at the age of twenty-one years and is a citizen of the United States, or who has filed his declaration of intention to become such, as required by the naturalization laws, in quantities not exceeding one hundred and sixty acres, if in legal subdivisions, according to the United States surveys, to be located in a body. And any person possessing

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the above requirements, owning and residing on lands, may, under the provisions of this section, donate other lands lying contiguous to his or her land, which shall not, with the land so already owned and occupied, exceed, in the aggregate, one hundred and sixty acres, in which case it shall not be required that such donee shall reside upon such donated land, but shall make proof of all other improvements required by this act.

SEC. 2. That the term contiguous, as used in this act, shall be construed to mean lands lying (not cornering) in a compact body.

SEC. 3. Any person wishing to obtain such donation shall apply therefor to the commissioner of state lands, and at the same time shall file in the office of said commissioner his or her affidavit stating that he or she possesses the qualifications required by section one (1) of this act, and that the land applied for is for the purpose of actual settlement, occupancy and cultivation by said applicant for his or her own exclusive benefit, and not directly or indirectly for the benefit or use of any other person or persons whomsoever; and that he or she had not theretofore had the benefit of any donation law of the state, provided, that when it shall be made to appear by the affidavit of any donee who has heretofore made or may hereafter make a donation entry supported by the affidavits of two creditable witnesses who are citizens of the county in which the land is situated, the creditability and citizenship of the two supporting witnesses to be certified to by the clerk of the circuit court of the county where said donee resides, that he or she had made a donation entry, but while acting in entire good faith through accident or mistake had failed to perfect title to such donation claim, he or she shall be allowed to redonate the same tract of land, or in case such land should be sold or otherwise disposed of by the state, such donee may upon proof as set out above be allowed to make a donation of

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another tract of land in a quantity not to exceed one hundred and sixty (160) acres.

SEC. 4. Upon filing with the commissioner of state lands a written application, and the affidavit provided for in section three (3) of this act, such commissioner shall issue a certificate under his hand and seal, setting forth that such applicant had applied for a donation of the right of the state to the land described in the application; which certificate shall further state that if within three (3) years from the date of actual settlement, in a house habitable at all seasons of the year upon said land, the applicant shall present proof, in the manner hereinafter provided, to the commissioner; he shall execute, under his hand and seal, the deed of the state to the donee, conveying all the right, title and interest of the state in and to the land described in said certificate.

SEC. 5. Each person receiving such donation shall establish his or her actual personal residence in a house upon the land applied for within three months from the date of such certificate. *Provided*, Any person who has received, or who may hereafter receive, a donation to any of the forfeited lands of the state, and who has been or who may hereafter be, prevented from establishing his or her actual personal residence upon his or her donation, within the time now prescribed by law, by inundation of such donation, or by adverse possession of said donation being held by another, or by any unavoidable cause, shall have the time extended for establishing such residence upon such donation, to such time as the hindering cause or causes herein mentioned have ceased, or shall cease to exist, not to exceed, however, eighteen months from the date of the donation, by presenting to the commissioner of state lands satisfactory proof, supported by the affidavit of two respectable citizens, that the donee was prevented from establishing his or her actual personal residence upon such donation, by the existence of one or more of the hindering causes enumerated in the

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section, and upon the presentation of such satisfactory proof to the commissioner of state lands, it shall be lawful for him to extend the time for establishing such residence to a time to be by him fixed according to the provisions of this act. Such donee shall actually reside upon, for a period of three years from the time herein fixed, or that may be fixed by the commissioner of state lands, according to the foregoing provisions for actual settlement, and shall clear, fence and place in cultivation at least five (5) acres of said land within such period; and within one (1) month of the date of the expiration of the three (3) years from the date of actual settlement, such donee shall obtain from the county surveyor for the county in which such lands may be situated, or in case of his absence or sickness, from any competent surveyor, whose competence shall be certified to by the clerk of the county court of the county in which such donation is situated, a certificate setting forth the proper description of the land embraced in such donation; and that he has within ten days next preceding the date of his certificate made an accurate and careful survey, according to the established lines of said lands as fixed by the United States, of the identical tract described, that the improvements on said land are bona fide and substantial, and that the donee has cleared, fenced and has in cultivation at least five (5) acres of such land. Such donee shall make proof before the county clerk or the clerk of the circuit court of the county wherein such land is situated, describing the improvements he has placed upon the land, giving the value of the same, the date of actual settlement, periods of his or her actual inhabitancy of the tract donated, which proof shall be corroborated by the separate testimony of two disinterested and respectable citizens, who shall be citizens of the county in which said donation is situated.

SEC. 6. The certificate of the county surveyor and the proof provided for in section five (5) of this act shall be filed

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in the office of the commissioner of state lands within sixty (60) days from the expiration of three (3) years from the date of actual settlement, and if the commissioner finds that the requirements of this act have been complied with in good faith by such donee, he shall issue to such donee the deed of the state, as provided by section four (4) of this act.

SEC. 7. The deeds of the commissioner shall be conclusive evidence in all courts of a good and valid title to the donee, his heirs and assigns, and shall be evidence that the land has been regularly forfeited by the original owner, that the state had properly donated its right thereto, and such evidence shall be received by the courts.

SEC. 8. A donee may at any time before the expiration of the time prescribed herein for making final proof relinquish to the state all his or her right, title, interest and claim in and to the lands so donated, and immediately upon the filing of such relinquishment in the office of the commissioner of state lands, the lands so relinquished shall become subject to re-donation by the first qualified applicant. *Provided*, That in no case of abandonment shall the person making such re-donation claim credit for residence on such lands by a former donee.

SEC. 9. Whenever a donee shall with his family, before making final proof absent himself from his donation for a period of six months at any one time, it shall be lawful for any citizen to contest the claim of such donee before the commissioner of state lands, by filing with such commissioner, his affidavit of such abandonment, corroborated by the affidavit of at least two witnesses, and upon the filing of such affidavit the commissioner shall order testimony in the case to be taken before some officer, authorized by law, and most convenient for the parties at interest, and on some day at least thirty days from the date of the filing of such affidavit, and the contestant shall secure personal service, or con-

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structive service, upon the donee of the time and place of the taking of such testimony, and such commissioner shall fix a date for hearing said contest case before him, and on the date so fixed by him he will take such additional testimony as may be presented to him, and shall, as soon as practicable thereafter, render his decision, and shall mail to both contestant and contestee notice thereof; and such commissioner shall immediately thereafter transmit all the papers in the case to the secretary of state, the attorney general and the state land commissioner, which officers shall constitute a board of review in such cases, and no additional testimony shall come before such board; such board shall return such papers with their finding endorsed thereon, which finding shall be considered final. If such finding shall be in favor of the contestant, he shall be allowed a preference right of thirty days from the notice of the final decision in the case, to be sent to him by the commissioner, within which time to re-donate such forfeited donation.

SEC. 10. No donee shall cut or remove any timber from the land taken under this or existing laws, except for the specific improvement of such donation, until the necessary proof of improvement shall have been filed with the commissioner of state lands, and the deed issued therefor; and any violation of this section shall be sufficient ground for instituting a contest against such donee, to be determined in the manner prescribed by section nine (9) of this act, and in addition such donee, and accessories thereto shall be prosecuted in the manner prescribed by law for depredating on the timbered lands of the state.

[Section 2 of amendatory act of March 3, 1861, is as follows: That the failure of the donee to establish a residence upon the land donated within the time prescribed by this act be, and the same is hereby, made an additional ground of contest of the donee's right to his donation.]

SEC. 11. No taxes on lands donated under this act shall

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be assessed and collected until the deeds of the state issue therefor.

SEC. 12. Donees may at any time after the expiration of one year from the date of making application purchase the land embraced in such donation from the state, upon making proof of at least six months of continued residence in the manner hereinbefore provided, by paying to the state the price fixed by the law for the sale of forfeited tax lands.

SEC. 13. The affidavit required by section three (3) of this act may be made before the commissioner of state lands, or before the clerk of the county or circuit courts, or some qualified notary public of the county in which the lands so applied for may be situate.

SEC. 14. No deeds shall be issued under this act to aliens, but they shall be first fully naturalized, and evidence thereof filed with the commissioner of state lands.

SEC. 15. It shall be the duty of the commissioner of state lands to prepare blank application [s], certificates of donation, deeds and all other necessary blanks, to meet the requirements of this act, which blanks shall conform to the provisions thereof.

SEC. 16. In case the donee should die before the expiration of the time herein required to submit final proof of the right to perfect, the same shall extend, first to the widow of the donee, and if she be dead, then to the children of such donee, and should they be minors, their duly appointed guardian or administrator of the estate of the deceased donee may make such final proof for the benefit of such minor heirs, and should there be neither widow or children surviving such donee, such right shall in such case descend to the father of the donee, and if he be dead, then to the mother of such donee, and if she be dead, then to the brothers and sisters of the deceased donee, any adult of which shall be competent to make such final proof; and in the event of the

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death of the donee it shall not be necessary that residence on the lands shall be maintained thereafter, but the cultivation of the land must be continuously maintained, and no donation shall be liable for any debt contracted by the donee prior to the execution of the deed therefor nor shall any alienation of the same be binding against the title of the state.

SEC. 17. All laws and parts of laws in conflict with this act be, and the same are hereby repealed, and this act shall take effect and be in force from and after its passage.

Approved April 4, 1887.

No maps or plates showing the location of state or United States lands are published for distribution. Indeed no list of such lands by subdivisions, or by maps, would be reliable the next day after publication, as purchases and entries are being made daily.

FORFEITED LANDS.

In consideration of the fact that state lands will soon be all taken up by homeseekers and lumbermen, even at the present rate of entries, we would earnestly recommend, that some legislation be had at an early day to perfect the title to these lands in the state, and to private holders.

While the state only proposes to convey whatever right, title and interest it may have in forfeited lands to purschasers, yet, it would be a great hardship upon actual settlers, after purchasing these lands and making improvements, to be subjected to law suits, and in some cases to the loss of their lands, without recourse. In this connection, it might be well for the state to adopt the plan of the general government in relation to her public domain, and withdraw all her lands from public sale. At least, all her agricultural lands, and reserve the same for homestead purposes only.

Our mineral deposits are rich and varied, and, no doubt, will be a source of great wealth to the state in time. But agriculture and horticulture are our chief concern.

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The tiller of the soil, take him in every relation of life, as a producer of wealth; a tax-payer; a citizen in time of peace, a soldier in time of war; as a foundation, both sure and steadfast, to maintain the state, society and church, he is the safest, best, most reliable factor in the prosperity and good government of Arkansas, in my judgment.

What we need most now, and, for all time, no doubt, is tillers of the soil; practical agriculturists and horticulturists. Give us an abundance of these, and railroads will be built every where needed, manufactures will be established, and mines will be opened under every "blossom."

UNITED STATES LAND.

The United States owned July 1, 1894, in this state, 4,687,573 acres of land. All of which is subject to homestead entry, except the mineral lands.

We give below the location of these lands by districts and counties, together with suggestions and general information as to entering government lands for homestead purposes and mining also.

These, in the main, are good lands for agriculture and fruit growing. They lie in the mountains and uplands mostly, with an abundance of timber and good water.

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LITTLE ROCK DISTRICT, TOTAL, 808,757.

Counties.	Acres.	Counties.	Acres.
Arkansas	1,589	Jackson	1,663
Ashley	127	Jefferson	969
Chicot	4,730	Lawrence	7,335
Clay	2,898	Lee	600
Cleburne	110,324	Lincoln	6,563
Cleveland	4,405	Lonoke	405
Conway	10,445	Mississippi	3,103
Craighead	844	Monroe	1,558
Crittenden	480	Perry	61,666
Cross	1,304	Phillips	160
Dallas	10,185	Poinsett	2,180
Desha	2,036	Prarie	489
Drew	2,085	Pulaski	19,215
Faulkner	7,817	Randolph	48,472
Fulton	47,227	St. Francis	408
Garland	2,078	Saline	49,071
Grant	5,702	Sharp	91,068
Green	2,811	Van Buren	225,772
Hot Spring	4,758	White	8,310
Independence	44,886	Woodruff	2,748
Izard	10,210		

J. J. BEAVERS, Register.

HARRISON DISTRICT, Total, 1,604,470.

Counties	Acres.	Counties.	Acres.
Benton	69,760	Independence	5,040
Boone	67,720	Marion	145,000
Baxter	145,940	Madison	84,730
Carroll	79,870	Newton	336,583
Franklin	1,840	Stone	242,750
Fulton	50,280	Searcy	234,760
Izard	57,320	Van Buren	36,480
		Washington	45,600

JOHN P. CLENDENNIN, Register.

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CAMDEN DISTRICT, Total, 1,027,898.

Counties.	Acres.	Counties.	Acres.
Ashley	17,000	Little River	4,840
Bradley	27,900	Miller	2,460
Calhoun	22,180	Montgomery	170,200
Clark	21,000	Nevada	800
Cleveland (pt)	4,700	Ouachita	7,780
Columbia	5,400	Pike	113,600
Drew	200	Polk	311,920
Garland	69,558	Saline (part)	5,440
Hempstead	600	Scott (part)	22,200
Hot Springs	31,120	Sevier	46,840
Howard	104,200	Union	31,060
Lafayette	6.900		

J. A. Ross, Receiver.

DARDANELLE DISTRICT, Total, 1,846,448.

Counties.	Acres.	Counties.	Acres.
Conway	14,240	Perry	135,462
Crawford	37,937	Polk	34,686
Franklin	35,990	Pope	143,504
Garland	67,840	Saline	55,800
Johnson	101,665	Scott	297,596
Logan	54,260	Sebastian	26,056
Montgomery	65,825	Yell	175,587

JOHN B. CROWNOVER, Receiver.

Grand total, 4,686,573.

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SUGGESTIONS AND GENERAL INFORMATION

AS TO

ENTERING GOVERNMENT LANDS FOR

RESIDENCE AND CULTIVATION.

1. There are about 4,687,573 acres of land in Arkansas belonging to the government. No lands are subject to private cash entry, except in the state of Missouri. The timber culture and pre-emption laws have been repealed.

2. Homestead entries can be made for not more than one quarter section, or 160 acres of land.

3. All applicants must stand upon equal footing, with equal rights and privileges to enter the public lands. "First come, first served."

4. The land office fees and commissions, payable when application is made, are as follows: On lands outside the railroad limits, $14.00 for 160 acres; $13.00 for 120 acres; $7.00 for 80 acres; $6.00 for 40 acres. On lands within the railroad limits, $18.00 for 160 acres; $16.00 for 120 acres; $9.00 for 80 acres; $7.00 for 40 acres. An entry of 81 acres will cost $10.00 fee. In the Pacific states and Rocky mountain region the charges are a little more.

5. The applicant *must* in *every case* state in his application his place of *his actual residence*, and the *post office address* to which notices relative to his entry shall be sent, and his full name.

6. Amendments of filings and entries are allowed by the general land office for real errors, where improvements were made by mistake on the wrong tract, but not for blunders which the claimant could have avoided by reasonable care and investigation.

Application for amendment must be sworn to and corroborated under seal and in no case need be more than two pages in length; must show how the error was made; that

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applicant has not sold or encumbered the tract, and that the amendment is not asked for the purpose of letting some one else enter the tract vacated.

7. When a person desires to enter a tract of land, he may appear personally at the district land office and present his application and make the required affidavit before the register and receiver. He must establish his residence in a house to be built on the land within six months from the date of entry, and must, in order to maintain his entry, reside on and cultivate the tract for five years, unless he desires to commute and pay for the land in cash or equivalent, which can be done after fourteen months actual residence on and cultivation of the tract.

8. The homestead affidavit can be made before the judge or clerk of a court of record or before a commissioner of the United States circuit court, and save the journey to the land office.

9. Entries under the homestead law can be completed after five years' actual residence; but the applicant is required to file with the register his notice of intention to make proof, with the required fee for publication, and it is the duty of the register to have said notice published, when the applicant will appear with two witnesses named in the notice and make proof on day named, and before officer mentioned.

10. In case of death of entryman, his widow has the right, at the proper time, to make proof of his residence, and her residence or cultivation of the tract for required time, and in case of the death of the widow, then the heirs.

A homestead right cannot be devised away from the widow or minor children.

11. Under an act of congress approved March 2d, 1889, a party who entered lands, prior to said act, has the right, where his said entry was canceled for any cause, to enter again, and where his entry is of record, he having failed to

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comply with the law as to residence, has the right to relinquish his claim to the United States, and enter the same or other tract, provided no other right has attached; the act further provides that, where an entry has been made, and the applicant is residing on the land entered which was for less than 160 acres, he has the right to enter, if adjoining, enough land to make 160 acres; and if none is adjoining he has the right to make entry elsewhere, after having proved up his first entry, the two entries not to contain over 160 acres.

12. Under act of congress approved August 30, 1890, one person can enter only 320 acres of public land. This act is held to be prospective and not retroactive. That is, no matter how much land a party entered prior to the date of the above act, he may thereafter, if in other respects qualified, enter 320 acres, but not more. This law does not apply to mineral or coal lands, but to lands which are classed as agricultural lands. The government does not guarantee that its "agricultural" lands will produce crops. Hence the intending settler should carefully examine in person or by agent the land he or she intends to enter.

13. A party desiring to relinquish his land to the United States for the purpose of re-entering or for the purpose of letting others enter, must make the following relinquishment on the back of his duplicate receipt acknowledged before some officer with a seal. "I hereby relinquish all my right, title, interest and claim in and to the within described lands to the United States." Relinquishment made at the land office can be made without any cost. In the event of the loss of the duplicate receipt, an affidavit accounting for the loss, made under seal, and relinquishment thereon, will be sufficient.

14. A single woman does not forfeit her homestead entry by marriage if thereafter she continues to comply with the law as to residence, improvements and cultivation.

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15. The first actual settler who makes entry within three months after actual settlement is entitled to land, while the first man who makes entry may have been last to make settlement, and hence have the least claim to the land. A preemption filing is no bar to a homestead entry.

16. A settlement does not mean actual residence, but preparation for it, to be followed up in good faith. The claimant should, in person, not by agent, start the erection of a house, or begin some other improvement on the land he claims. A homestead entry does not require prior settlement, but it is safest to make a settlement at the earliest date.

17. Final proof in homestead entries can be made after five years from date of entry or of actual residence on the land, and must be made before the expiration of seven years from date of entry.

The time during the rebellion, if not less than ninety days, which the homestead settler served in the army, navy or marine corps shall be deducted from the time heretofore required to perfect title, or if discharged on account of wounds received or disability incurred in the line of duty then the term of enlistment shall be deducted from the time heretofore required to perfect title, without reference to the length of time he may have served; but no patent shall issue to any homestead settler who has not resided upon, improved and cultivated his homestead for a period of at least one year after he shall have commenced his improvements.

18. The receiver's duplicate homestead receipt, which the entryman received on making entry, should be surrendered on making commuted or final homestead proof.

Parties are often put to a great loss and inconvenience by the loss of receiver's receipts, which should always be carefully preserved.

19. The application to make proof, blank No. 4–348, homestead, should be signed by the claimant himself. His

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four witnesses should, if possible, be near neighbors, fully conversant with the facts essential to perfect proof, and none of them should be relatives of the claimant.

20. It is the duty of applicant who makes proof before county officers to see that each question is filled out with complete answers; must show that he is a native born citizen of the United States, if such is the case, and if not, then certified copy of naturalization papers will be sufficient, if the entry is by a woman she must state specifically in the proof whether or not she is married or single; applicants should in every case see that the names of witnesses used in making proof are properly advertised; and that they sign their names as advertised, and in giving the names to be published they should ascertain and give their full christian names, and, if possible, the four living nearest the land for which proof is to be made. Much trouble and delay has been occasioned by doubtful or different spelling of names. Some persons have actually spelled their names three different ways in making one proof. This makes necessary correspondence and explanatory affidavits, causes delays in receipt of patents and places suspicion on proof.

21. The proof should, if possible, be taken on the day advertised, before the officer advertised, with the evidence of at least two of the witnesses advertised; these, together with the duplicate receipt and the required fees and commissions, to be sealed up and transmitted to the receiver, on the same day proof is taken.

22. The land office commissions, *payable at the time of making final homestead proof*, are as follows:

On land outside of railroad limits:

For 160 acres	$4 00
For 120 acres	3 00
For 80 acres	2 00
For 40 acres	1 00

On land within the railroad limits:

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For 160 acres..... $8 00
For 120 acres..... 6 00
For 80 acres..... 4 00
For 40 acres..... 2 00

The fees for reducing testimony to writing in making final proof are 15 cents for each 100 words, which in each case amounts to one dollar, sometimes $1.50, which must be transmitted with the other final proof commissions. In the Pacific states and Rocky mountain region the charges are one-half higher.

23. All applicants for lands should see that their applications are made out for the exact numbers of land desired to be entered, which must lie and form a compact body. If for an adjoining farm, the land owned and resided on must form a compact body with the public land; and the two together must not exceed 160 acres.

24. A married woman has no right to make a homestead entry.

25. A single woman over the age of twenty-one years has the right to make a homestead entry.

26. A man has to be twenty-one years of age to make an entry, unless he is married or the head of a family.

27. If a married woman who has been deserted by her husband desires to prove up, she should address the local officers of the land office, stating the nature of her case, and ascertain if she has the right to make proof.

28. In case of the death of both father and mother, the guardian of the minor children, after obtaining the required order of the probate court within two years of the death of the surviving parent, may sell the land for the exclusive benefit of such minor children, and patent will issue to the purchaser on payment of the office fees.

29. The widow or children of a homesteader are not required to reside on their homestead after his death, but must continue cultivation by agent or otherwise. The

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widow can enter a homestead in her own right while cultivating that of her deceased husband, in which event she must actually reside on the land entered in her own name.

30. In contests initiated by affidavit, the affidavit should be corroborated by preferably two witnesses. When service is had by publication, the posting of a copy of notice on the land, and mailing (by registered letter), a copy to contestee, to his last known address, are absolutely essential, as is also proof of both, and this is the duty of the parties or their attorneys, not of the land officers.

31. Where a party desires to file a protest against an entry on the day of proof, it is the duty of the officer taking the proof to make down the protestant's testimony and that of his witnesses, and transmit the same with the proof to the local office. The party protesting must pay the cost of reducing the evidence of himself and witnesses to writing.

32. The government does not issue a general map showing what are public untaken lands. Land officers are authorized by law to furnish plats or diagrams showing what lands are vacant and what lands are taken. Parties writing for numbers, dates, descriptions, etc., of several tracts can get this information by ordering plats from the local officers.

The charges to be made by the local officers for the plat or diagram of a particular township are fixed as follows:

For plat showing what land is public and what entered $1 00

For plat showing entries and names of claimants 2 00

For plat showing entries and names, numbers and character of lands 3 00

For plat showing entries and names, numbers and character and date of entry, together with topography 4 00

For plat or diagram of a part of a township or section, a proportionate amount is charged.

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33. Any person desiring information about public land should always give the section, township and range, for which information is asked, together with the numbers of land, and such information will always be furnished free of charge by the local officers.

34. When patents are received at the office, the register and receiver at once prepare notice and send to the entrymen, when they can return their duplicate final receipts given them when proof was made, and patent will be sent free of charge.

35. Papers once filed cannot be returned unless it be to correct a clerical error.

36. It is the duty of the applicant when he makes application to ascertain from county or other records the exact area in the tract, and if over 160 acres, he must, in addition to the $14.00 entrance fee, pay for the excess over 160 acres at the rate of $1.25 or $2.50 per acre, as the case may be; many parties having lost their lands by such failure.

37. When an entry is made for land that has been covered by a prior entry, the residence will date from the time when the last entry is placed of record, or from date of cancellation of the first entry, or from date of settlement if settlement was after the date of cancellation.

38. No person who is the proprietor of more than 160 acres of land in any state or territory shall acquire any right under the homestead law.

39. A homesteader forfeits his entry if he transfers any portion thereof before final receipt issues, except it be for school, church or cemetery purposes, or for the right of way of railroads, canals or ditches for irrigating purposes.

40. Land warrants and other cheap scrip can be used only in commuted homestead entries, where the entryman having resided on and cultivated the tract embraced by his homestead entry for fourteen months, advertises and makes the required proof.

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41. The secretary of the interior is authorized, upon proof being made, to his satisfaction, that any tract of land has been erroneously sold by the United States, so that from any cause the sale cannot be confirmed, to repay to the purchaser, or his legal representatives or assigns, the sum of money which was paid therefor, out of any money in the treasury not otherwise appropriated.

42. In case of application for repayment where patent has not issued, the duplicate receipt must be surrendered. The applicant must also make affidavit that he has not transferred or otherwise encumbered the title to the land, and that said title has not become a matter of record. This affidavit may be made before either the register or receiver of the district land office, or before a notary public or a justice of the peace, or other officer authorized to administer oaths. When made before a notary public or justice of the peace, a certificate of official character is required.

43. Parties who have made entries of less than 160 acres of land are, under some circumstances, allowed to enter enough more land to make up 160 acres; in some cases they are permitted to relinquish their entries and make new entries. A full statement of the facts in each case should be submitted to the local officers for their judgment and advice.

44. The commissioner of the general land office expressly forbids the local officers to furnish blank entry papers and affidavits to anybody except claimants in person.

Further information will be given by applying to registers United States land office at Little Rock, Camden, Dardanelle and Harrison, Arkansas.

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UNITED STATES MINING LAWS.

DEPARTMENT OF THE INTERIOR,
GENERAL LAND OFFICE,
Washington, May 16, 1893.

This circular is reissued for the information and benefit of those concerned.

S. W. LAMOREUX,
Commissioner.

MINERAL LANDS OPEN TO EXPLORATION, OCCUPATION, AND PURCHASE.

1. It will be perceived that by the mining laws the mineral lands in the public domain, surveyed or unsurveyed, are open to exploration, occupation, and purchase by all citizens of the United States and all those who have declared their intentions to become such.

STATUS OF LODE-CLAIMS LOCATED PRIOR TO MAY 10, 1872.

2. By an examination of the several sections of the Revised Statutes it will be seen that the *status* of lode-claims located *previous* to the 10th May, 1872, is not changed with regard to their *extent along the lode or width of surface.*

3. Mining rights acquired under such previous locations are, however, enlarged by such revised statutes in the following respect, viz: The locators of all such previously taken veins or lodes, their heirs and assigns, so long as they comply with the laws of congress and with state, territorial, or local regulations not in conflict therewith, governing mining cla[illegible]s, are invested with the exclusive possessory right of [illegible]he surface included within the lines of their locations, and of all veins, lodes, or ledges throughout their entire depth, the top or apex of which lies inside of such surface lines extended downward vertically, although such veins, lodes, or ledges may so far depart from a perpendicular in their course downward as to extend outside the verti-

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cal side-lines of such locations at the surface, it being expressly provided, however, that the right of possession to such outside parts of said veins or ledges shall be confined to such portions thereof as lie between vertical planes drawn downward, as aforesaid, through the end lines of their locations so continued in their own direction that such planes will intersect such exterior parts of such veins, lodes, or ledges; no right being granted, however, to the claimant of such outside portion of a vein or ledge to enter upon the surface location of another claimant.

4. It is to be distinctly understood, however, that the law limits the possessory right to veins, lodes, or ledges, *other* than the one named in the original location, to such as were not *adversely claimed on May* 10, 1872, and that where such other vein or ledge was so adversely claimed at that date, the right of the party so adversely claiming is in no way impaired by the provisions of the revised statutes.

5. In order to hold the possessory title to a mining claim located prior to May 10, 1872, and for which a patent has not been issued, the law requires that *ten dollars* shall be expended annually in labor or improvements on each claim of *one hundred feet* on the course of the vein or lode until a patent shall have been issued therefor; but where a number of such claims are held in common upon the same vein or lode, the aggregate expenditure that would be necessary to hold all the claims, at the rate of ten dollars per hundred feet, may be made upon any one claim; a failure to comply with this requirement in any one year subjecting the claim upon which such failure occurred to relocation by other parties, the same as if no previous location thereof had ever been made, unless the claimaints under the original location shall have resumed work thereon after such failure and before such relocation. The first annual expenditure upon claims of this class should have been performed subsequent to May 10, 1872, and prior to January 1, 1875.

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From and after January 1, 1875, the required amount must be expended *annually* until patent issues. By decision of the honorable secretary of the interior, dated March 4, 1879, such annual expenditures are not required subsequent to entry, the date of issuing the patent certificate being the date contemplated by statute.

6. Upon the failure of any one of several co-owners of a vein, lode, or ledge, which has not been entered, to contribute his proportion of the expenditures necessary to hold the claim or claims so held in ownership in common, the co-owners, who have performed the labor or made the improvements as required by said revised statutes, may, at the expiration of the year, give such delinquent co-owner personal notice in writing, or notice by publication in the newspaper published nearest the claim for at least once a week for ninety days; and if upon the expiration of ninety days after such notice in writing, or upon the expiration of one hundred and eighty days after the first newspaper publication of notice, the delinquent co-owner shall have failed to contribute his proportion to meet such expenditures or improvements, his interest in the claim by law passes to his co-owners who have made the expenditures or improvements as aforesaid. Where a claimant alleges ownership of a forfeited interest under the foregoing provision, the sworn statement of the publisher as to the facts of publication, giving dates and a printed copy of the notice published, should be furnished, and the claimant must swear that the delinquent co-owner failed to contribute his proper proportion within the period fixed by the statute.

PATENTS FOR VEINS OR LODES HERETOFORE ISSUED.

7. Rights under patents for veins or lodes heretofore granted under previous legislation of congress are enlarged by the revised statutes so as to invest the patentee,

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his heirs or assigns, with title to all veins, lodes, or ledges throughout their entire depth, the top or apex of which lies within the end and side boundary lines of his claim on the surface, as patented, extended downward vertically, although such veins, lodes, or ledges may so far depart from a perpendicular in their course downward as to extend outside the vertical side-lines of the claims at the surface. The right of possession to such outside parts of such veins or ledges to be confined to such portions thereof as lie between vertical planes drawn downward through the end lines of the claims at the surface, so continued in their own direction that such planes will intersect such exterior parts of such veins or ledges; it being expressly provided, however, that all veins, lodes, or ledges, the top or apex of which lies inside such surface locations, *other* than the one named in the patent, which were *adversely claimed on the 10th May*, 1872, are excluded from such conveyance by patent.

8. Applications for patents for mining claims pending at the date of the act of May 10, 1872, may be prosecuted to final decision in the General Land office, and where no adverse rights are affected thereby, patents will be issued in pursuance of the provisions of the revised statutes.

MANNER OF LOCATING CLAIMS ON VEINS OR LODES AFTER MAY 10, 1872.

9. From and after the 10th May, 1872, any person who is a citizen of the United States, or who has declared his intention to become a citizen, may locate, record, and hold a mining claim of *fifteen hundred linear feet* along the course of any mineral vein or lode subject to location; or an association of persons, severally qualified as above may make joint location of such claim of *fifteen hundred feet*, but in no event can a location of a vein or lode made subsequent to May 10, 1872, exceed fifteen hundred feet along the course thereof, whatever may be the number of persons composing the association.

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With regard to the extent of surface ground adjoining a vein or lode, and claimed for the convenient working hereof, the revised statutes provide that the lateral extent of ocations of veins or lodes made after May 10, 1872, shall n no case *exceed three hundred feet on each side of the middle of the vein at the surface*, and that no such surface rights hall be limited by any mining regulations to less than twenty-five feet on each side of the middle of the vein at the urface, except where adverse rights existing on the 10th May, 1872, may render such limitation necessary; the endines of such claims to be in all cases parallel to each other. Said lateral measurements cannot extend beyond three hunlred feet on *either* side of the middle of the vein at the surface, or such distance as is allowed by local laws. For exmple: 400 feet cannot be taken on one side and 200 feet on the other. If, however, 300 feet on each side are allowed, and by reason of prior claims but 100 feet can be aken on one side, the locator will not be restricted to less han 300 feet on the other side; and when the locator does not determine by exploration *where* the middle of the vein t the surface is, his discovery shaft must be assumed to nark such point.

11. By the foregoing it will be perceived that no lode-laim located after the 10th May, 1872, can exceed a parllelogram fifteen hundred feet in length by six hundred feet n width, but whether surface-ground of that width can be aken, depends upon the local regulations or state or territorial laws in force in the several mining districts; and that o such local regulations or state or territorial laws shall mit a vein or lode claim to less than fifteen hundred feet ong the course thereof, whether the location is made by e or more persons, nor can surface rights be limited to less an fifty feet in width, unless adverse claims existing on the th day of May, 1872, render such lateral limitation necsary.

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12. It is provided by the revised statutes that the miners of each district may make rules and regulations not in conflict with the laws of the United States, or of the state or territory in which such districts are respectively situated, governing the location, manner of recording, and amount of work necessary to hold possession of a claim. They likewise require that the location shall be so distinctly marked on the ground that its boundaries may be readily traced. This is a very important matter, and locators cannot exercise too much care in defining their locations at the out set, inasmuch as the law requires that all records of mining locations made subsequent to May 10, 1872, shall contain the name or names of the locators, the date of the location, and such a *description of the claim or claims* located, by reference to some natural object or permanent monument, as will identify the claim.

13. The statutes provide that no lode-claim shall be recorded until after the discovery of a vein or lode within the limits of the claim located, the object of which provision is evidently to prevent the appropriation of presumed mineral ground for speculative purposes to the exclusion of *bona fide* prospectors, before sufficient work has been done to determine whether a vein or lode really exists.

14. The claimant should, therefore, prior to locating his claim, unless the vein can be traced upon the surface, sink a shaft, or run a tunnel or drift, to a sufficient depth therein to discover and develop a mineral-bearing vein, lode, or crevice; should determine, if possible, the general course of such vein in either direction from the point of discovery, by which direction he will be governed in marking the boundaries of his claim on the surface. His location notice should give the course and distance as nearly as practicable from the discovery-shaft on the claim, to some permanent, well-known points or objects, such, for instance, as stone monuments, blazed trees, the confluence of streams,

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point of intersection of well-known gulches, ravines, or roads, prominent buttes, hills, etc., which may be in the immediate vicinity, and which will serve to perpetuate and fix the *locus* of the claim and render it susceptible of identification from the description thereof given in the record of locations in the district, and should be duly recorded.

15. In addition to the foregoing data, the claimant should state the names of adjoining claims, or, if none adjoin, the relative positions of the nearest claims; should drive a post or erect a monument of stones at each corner of his surface-ground, and at the point of discovery or discovery shaft should fix a post, stake, or board, upon which should be designated the name of the lode, the name or names of the locators, the number of feet claimed, and in which direction from the point of discovery; it being essential that the location notice filed for record, in addition to the foregoing description, should state whether the entire claim of fifteen hundred feet is taken on one side of the point of discovery, or whether it is partly upon one and partly upon the other side thereof, and in the latter case, how many feet are claimed upon each side of such discovery-point.

16. Within a reasonable time say twenty days after the location shall have been marked on the ground, or such time as is allowed by the local laws, notice thereof, accurately describing the claim in manner aforesaid should be filed for record with the proper recorder of the district, who will thereupon issue the usual certificate of location.

17. In order to hold the possessory right to a location made since May 10, 1872, not less than one hundred dollars' worth of labor must be performed, or improvements made thereon annually until entry shall have been made. Under the provisions of the act of congress approved January 22, 1880, the first annual expenditure becomes due and must be performed during the calendar year succeeding that in which the location was made. Expenditure made or labor

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performed prior to the first day of January succeeding the date of location will not be considered as a part of, or applied upon the first annual expenditure required by law. Failure to make the expenditure or perform the labor required will subject the claim to relocation by any other party having the necessary qualifications, unless the original locator, his heirs, assigns, or legal representatives have resumed work thereon after such failure and before such relocation.

18. The expenditures required upon mining-claims may be made from the surface or in running a tunnel for the development of such claims, the act of February 11, 1875, providing that where a person or company has, or may, run a tunnel for the purpose of developing a lode or lodes owned by said person or company, the money so expended in said tunnel shall be taken and considered as expended on said lode or lodes, and such person or company shall not be required to perform work on the surface of said lode or lodes in order to hold the same.

19. The importance of attending to these details in the matter of location, labor and expenditure will be the more readily perceived when it is understood that a failure to give the subject proper attention may invalidate the claim.

TUNNEL RIGHTS.

20. Section 2323 provides that where a tunnel is run for the development of a vein or lode, or for the discovery of mines, the owners of such tunnel shall have the right of possession of all veins or lodes within three thousand feet from the face of such tunnel on the line thereof, not previously known to exist, discovered in such tunnel, to the same extent as if discovered from the surface; and locations on the line of such tunnel of veins or lodes not appearing on the surface, made by other parties after the commencement of the tunnel, and while the same is being prosecuted with reasonable diligence, shall be invalid; but failure to prose-

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cute the work on the tunnel for six months shall be considered as an abandonment of the right to all undiscovered veins or lodes on the line of said tunnel.

21. The effect of this is simply to give the proprietors of a mining tunnel run in good faith the possessory right to fifteen hundred feet of any blind lodes cut, discovered, or intersected by such tunnel, which were not previously known to exist, within three thousand feet from the face or point of commencement of such tunnel, and to prohibit other parties, after the commencement of the tunnel, from prospecting for and making locations of lodes on the *line thereof* and within said distance of three thousand feet, unless such lodes appear upon the surface or were previously known to exist.

22. The term "face," as used in said section, is construed and held to mean the first working face formed in the tunnel, and to signify the point at which the tunnel actually enters cover; it being from this point that the three thousand feet are to be counted, upon which prospecting is prohibited as aforesaid.

23. To avail themselves of the benefits of this provision of law, the proprietors of a mining tunnel will be required, at the time they enter cover as aforesaid, to give proper notice of their tunnel location by erecting a substantial post, board, or monument at the face or point of commencement thereof, upon which should be posted a good and sufficient notice, giving the names of the parties or company claiming the tunnel-right; the actual or proposed course or direction of the tunnel; the height and width thereof, and the course and distance from such face or point of commencement to some permanent well-known objects in the vicinity by which to fix and determine the *locus* in manner heretofore set forth applicable to locations of veins or lodes, and at the time of posting such notice they shall, in order that miners or prospectors may be enabled to determine whether or not they are within the lines of the tunnel, establish the boundary

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lines thereof, by stakes or monuments placed along such lines at proper intervals to the terminus of the three thousand feet from the face or point of commencement of the tunnel, and the lines so marked will define and govern as to the specific boundaries within which prospecting for lodes not previously known to exist is prohibited while work on the tunnel is being prosecuted with reasonable diligence.

24. At the time of posting notice and marking out the lines of the tunnel as aforesaid, a full and correct copy of such notice of location defining the tunnel claim must be filed for record with the mining recorder of the district, to which notice must be attached the sworn statement or declaration of the owners, claimants, or projectors of such tunnel, setting forth the facts in the case; stating the amount expended by themselves and their predecessors in interest in prosecuting work thereon; the extent of the work performed, and that it is *bona fide* their intention to prosecute work on the tunnel so located and described with reasonable diligence for the development of a vein or lode, or for the discovery of mines, or both, as the case may be. This notice of location must be duly recorded, and, with the said sworn statement attached, kept on the recorder's files for future reference.

25. By a compliance with the foregoing much needless difficulty will be avoided, and the way for the adjustment of legal rights acquired in virtue of said section 2323 will be made more easy and certain.

26. This office will take particular care that no improper advantage is taken of this provision of law by parties making or professing to make tunnel locations, ostensibly for the purposes named in the statute, but really for the purpose of monopolizing the lands lying in front of their tunnels to the detriment of the mining interests and to the exclusion of *bona fide* prospectors or miners, but will hold such tunnel claimants to a strict compliance with the terms of the stat-

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utes; and a *reasonable diligence* on their part in prosecuting the work is one of the essential conditions of their implied contract. Negligence or want of due diligence will be construed as working a forfeiture of their right to all undiscovered veins on the line of such tunnel.

MANNER OF PROCEEDING TO OBTAIN GOVERNMENT TITLE TO VEIN OR LODE CLAIMS.

27. By section 2325 authority is given for granting titles for mines by patent from the government to any person, association or corporation having the necessary qualifications as to citizenship and holding the right of possession to a claim in compliance with law.

28. The claimant is required in the first place to have a correct survey of his claim made under authority of the survey-general of the state or territory in which the claim lies; such survey to show with accuracy the exterior surface boundaries of the claim, which boundaries are required to be distinctly marked by monuments on the ground. Four plats and one copy of the original field notes, in each case, will be prepared by the surveyor-general; one plat and the original field notes to be retained in the office of the surveyor-general, one copy of the plat to be given the claimant for posting upon the claim, one plat and a copy of the field notes to be given the claimant for filing with the proper register, to be finally transmitted by that officer, with other papers in the case, to this office, and one plat to be sent by the surveyor-general to the register of the proper land district, to be retained on his files for future reference. As there is no resident surveyor-general for the State of Arkansas, application for the survey of mineral claims in said state should be made to the commissioner of this office, who, under the law, is *ex-officio* the United States surveyor-general.

29. The claimant is then required to post a copy of the plat of such survey in a conspicuous place upon the claim,

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together with notice of his intention to apply for a patent therefor, which notice will give the date of posting, the name of the claimant, the name of the claim, mine or lode; the mining district and county; whether the location is of record, and, if so, where the record may be found; the number of feet claimed along the vein and the presumed direction thereof; the number of feet claimed on the lode in each direction from the point of discovery, or other well-defined place on the claim; the name or names of adjoining claimants on the same or other lodes; or, if none adjoin, the names of the nearest claims, &c.

30. After posting the said plat and notice upon the premises, the claimant will file with the proper register and receiver a copy of such plat and the field notes of survey of the claim, accompanied by the affidavit of at least two credible witnesses, that such plat and notice are posted conspicuously upon the claim, giving the date and place of such posting; a copy of the *notice* so posted to be attached to, and form a part of, said affidavit.

31. Accompanying the field notes so filed must be the sworn statement of the claimant that he has the possessory right to the premises therein described, in virtue of a compliance by himself (and by his grantors, if he claims by purchase) with the mining rules, regulations and customs of the mining district, state or territory in which the claim lies, and with the mining laws of congress; such sworn statement to narrate briefly, but as clearly as possible, the facts constituting such compliance, the origin of his possession and the basis of his claim to a patent.

32. This affidavit should be supported by appropriate evidence from the mining recorder's office as to his possessory right, as follows, viz: Where he claims to be the locator, or a locator in company with others who have since conveyed their interest in the location to him, a full, true and correct copy of such location should be furnished, as

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the same appears upon the mining records; such copy to be attested by the seal of the recorder, or if he has no seal, then he should make oath to the same being correct, as shown by his records. Where the applicant claims only as a purchaser for valuable consideration, a copy of the location record must be filed under seal or upon oath as aforesaid, with an abstract of title from the proper recorder, under seal or oath as aforesaid, brought down as near as practicable to date of filing the application, tracing the right of possession by a continuous chain of conveyances from the original locators to the applicant, also certifying that no conveyances affecting the title to the claim in question appear of record in his office other than those set forth in the accompanying abstract.

33. In the event of the mining records in any case having been destroyed by fire or otherwise lost, affidavit of the fact should be made, and secondary evidence of possessory title will be received, which may consist of the affidavit of the claimant, supported by those of any other parties cognizant of the facts relative to his location, occupancy, possession, improvements, &c.; and in such case of lost records, any deeds, certificates of location or purchase, or other evidence which may be in the claimant's possession and tend to establish his claim, should be filed.

34. Upon the receipt of these papers the register will, at the expense of the claimant (who must furnish the agreement of the publisher to hold applicant for patent alone responsible for charges of publication), publish a notice of such application for the period of sixty days in a newspaper published nearest to the claim, and will post a copy of such notice in his office for the same period. When the notice is published in a *weekly* newspaper ten consecutive insertions are necessary; when in a *daily* newspaper the notice should appear in each issue for sixty-one consecutive issues, the first day of issue being excluded in estimating the period of sixty days.

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35. The notices so published and posted must be as full and complete as possible, and embrace all the *data* given in the notice posted upon the claim.

36. Too much care cannot be exercised in the preparation of these notices, inasmuch as upon their accuracy and completeness will depend, in a great measure, the regularity and validity of the whole proceeding.

37. In the publication of final-proof notices the register has *no discretion* under the law to designate any other than the newspaper "nearest the land" for such purpose when such paper is a newspaper of general circulation. But he will in all cases designate the newspaper of general circulation that is published nearest the land, geographically measured. When two or more such newspapers are published in the same town, nearest the land, he may select the one which, in his honest and impartial judgment as a public officer, will best subserve the purpose of the law and the general interests of the public.

38. Newspaper charges must not exceed the rates established by this office for the publication of legal notices.

39. The claimant, either at the time of filing these papers with the register or at any time during the sixty days' publication, is required to file a certificate of the surveyor-general that not less than five hundred dollars' worth of labor has been expended or improvements made upon the claim by the applicant or his grantors; that the plat filed by the claimant is correct; that the field-notes of the survey, as filed, furnish such an accurate description of the claim as will, if incorporated into a patent, serve to fully identify the premises, and that such reference is made therein to natural objects or permanent monuments as will perpetuate and fix the *locus* thereof.

40. It will be the more convenient way to have this certificate indorsed by the surveyor-general, both upon the plat and field-notes of survey filed by the claimant as aoresaid

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41. After the sixty days' period of newspaper publication has expired the claimant will furnish from the office of publication a sworn statement that the notice was published for the statutory period, giving the first and last day of each publication, and his own affidavit showing that the plat and notice aforesaid remained conspicuously posted upon the claim sought to be patented during said sixty days' publication, giving the dates.

42. Upon the filing of this affidavit the register will, if no adverse claim was filed in his office during the period of publication, permit the claimant to pay for the land, according to the area given in the plat and field notes of survey aforesaid, at the rate of five dollars for each acre and five dollars for each fractional part of an acre, the receiver issuing the usual duplicate receipt therefor. The claimant will also make a sworn statement of all charges and fees paid by him for publication and surveys, together with all fees and money paid the register and receiver of the land office; after which the whole matter will be forwarded to the commissioner of the general land office and a patent issued thereon if found regular.

43. In sending up the papers in the case the register must not omit certifying to the fact that the notice was posted in his office for the full period of sixty days, such certificate to state distinctly when such posting was done and how long continued.

44. The consecutive series of numbers of mineral entries must be continued, whether the same are of lode or placer claims or mill sites.

45. The surveyor-general should designate all surveyed mineral claims by a progressive series of numbers, beginning with survey No. 37, irrespective as to whether they are situated on surveyed or unsurveyed lands, the claim to be so designated at date of issuing the order therefor, in addition to the local designation of the claim; it being required in

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all cases that the plat and field-notes of the survey of a claim, must, in addition to the reference to permanent objects in the neighborhood, describe the locus of the claim, with reference to the lines of public surveys, by a line connecting a corner of the claim with the nearest public corner of the United States surveys, unless such claim be on unsurveyed lands at a distance of more than two miles from such public corner, in which latter case it should be connected with a United States mineral monument. Such connecting line must not be more than *two miles* in length and should be measured on the ground direct between the points, or calculated from actually surveyed traverse lines if the nature of the country should not permit direct measurement. If a regularly established survey corner is within two miles of a claim situated on unsurveyed lands, the connection should be made with such corner in preference to a connection with a United States mineral monument. The connecting line must be surveyed by the deputy mineral surveyor at the time of his making the particular survey, and be made a part thereof.

46. Upon the approval of the survey of a mining claim made upon surveyed lands, the surveyor-general will prepare and transmit to the local land office and to this office a diagram tracing showing the portions of legal 40-acre subdivisions made fractional by reason of the mineral survey, designating each of such portions by the proper lot number, beginning with No. 1 in each section and giving the area of each lot.

47. The survey and plat of mineral claims, required by section 2325, revised statutes of the United States, to be filed in the proper land office, with application for patent, must be made subsequent to the recording of the location of the mine; and when the original location is made by survey of a United States deputy surveyor such location sur-

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vey cannot be substituted for that required by the statute, as above indicated.

48. The surveyor-general should derive his information upon which to base his certificate as to the value of labor expended or improvements made from his deputy who makes the actual survey and examination upon the premises, and such deputy should specify with particularity and full detail the character and extent of such improvements.

49. The following particulars should be observed in the survey of every mining claim:

(1) The exterior boundaries of the claim should be represented on the plat of survey and in the field notes.

(2) The intersection of the lines of the survey with the lines of conflicting prior surveys should be noted in the field-notes and represented upon the plat.

(3) Conflicts with unsurveyed claims, where the applicant for survey does not claim the area in conflict, should be shown by actual survey.

(4) The total area of the claim embraced by the exterior boundaries should be stated, and also the area in conflict with each intersecting survey, substantially as follows:

	Acres.
Total area of claim	10.50
Area in conflict with survey No. 302	1.56
Area in conflict with survey No. 948	2.33
Area in conflict with Mountain Maid lode mining claim, unsurveyed	1.48

It does not follow that because mining surveys are required to exhibit all conflicts with prior surveys the areas of conflict are to be excluded. The field-notes and plat are made a part of the application for patent, and care should be taken that the description does not inadvertently exclude portions intended to be retained. It is better that the application for patent should state the portions to be excluded in express terms. A survey executed as in the example

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given will enable the applicant for patent to exclude such conflicts as may seem desirable. For instance, the conflict with survey No. 302 and with the Mountain Maid lode claim might be excluded and that with survey No. 948 included.

50. The rights granted to locators under section 2322, revised statutes, are restricted to such locations on veins, lodes, or ledges, as may be "situated on the *public domain.*" In applications for lode claims where the survey conflicts with a prior valid lode claim or entry and the ground in conflict is excluded, the applicant not only has no right to the excluded ground, but he has no right to that portion of any vein or lode the top or apex of which lies within such excluded ground, unless his location was prior to May 10, 1872. His right to the lode claimed terminates where the lode, in its onward course or strike, intersects the exterior boundary of such excluded ground and passes within it.

51. The end line of his survey should not, therefore, be established beyond such intersection, unless it should be necessary so to do for the purpose of including ground held and claimed under a location which was made upon public land and valid at the time it was made. To include such ground (which may possibly embrace other lodes) the end line of the survey may be established within the conflicting survey, but the line must be so run as not to extend any farther into the conflicting survey than may be necessary to make such end line parallel to the other end line and at the same time embrace the ground so held and claimed. The useless practice in such cases of extending *both* the side lines of a survey into the conflicting survey and establishing an end line wholly within it, beyond a point necessary under the rule just stated, will be discontinued.

PLACER CLAIMS.

52. The proceedings to obtain patents for claims usually called placers, including all forms of deposit, excepting veins of quartz or other rock in place, are similar to the pro-

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ceedings prescribed for obtaining patents for vein or lode claims; but where said placer claim shall be upon surveyed lands, and conform to legal subdivisions, no further survey or plat will be required, and all placer mining claims located after May 10, 1872, shall conform as nearly as practicable with the United States system of public-land surveys and the rectangular subdivisions of such surveys, and no such location shall include more than twenty acres for each individual claimant; but where placer claims can not be conformed to legal subdivisions, survey and plat shall be made as on unsurveyed land. But where such claims are located previous to the public surveys, and do not conform to legal subdivisions, survey, plat, and entry thereof may be made according to the boundaries thereof, provided the location is in all respects legal.

53. The proceedings for obtaining patents for veins or lodes having already been fully given, it will not be necessary to repeat them here, it being thought that careful attention thereto by applicants and the local officers will enable them to act understandingly in the matter and make such slight modifications in the notice, or otherwise, as may be necessary in view of the different nature of the two classes of claims, placer claims being fixed, however, at two dollars and fifty cents per acre, or fractional part of an acre.

54. By section 2330, authority is given for the subdivision of forty-acre legal subdivisions into *ten-acre* lots, which is intended for the greater convenience of miners in segregating their claims both from one another and from intervening agricultural lands.

55. It is held, therefore, that under a proper construction of the law these ten-acre lots in mining districts should be considered and dealt with, to all intents and purposes, as legal subdivisions, and that an applicant having a legal claim which conforms to one or more of these ten-acre lots,

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either adjoining or cornering, may make entry thereof, after the usual proceedings, without further survey or plat.

56. In cases of this kind, however, the notice given of the application must be very specific and accurate in description, and as the forty-acre tracts may be subdivided into ten-acre lots, either in the form of squares of ten by ten chains, or, if parallelograms five by twenty chains, so long as the lines are parallel and at right angles with the lines of the public surveys, it will be necessary that the notice and application state specifically what ten-acre lots are sought to be patented, in addition to the other *data* required in the notice.

57. Where the ten-acre subdivision is in the form of a square it may be described, for instance, as the "SE. 1-4 of the S. W. 1-4 of the NW. 1-4," or if in the form of a parallelogram as aforesaid, it may be described as the "W. 1-2 of the W. 1-2 of the SW. 1-4 of the NW. 1-4 (or the N. 1-2 of the S. 1-2 of the NE. 1-4 of the SE. 1-4) of section ——, township ——— range ———," as the case may be; but, in addition to this description of the land, the notice must give all the other *data* that is required in a mineral application, by which parties may be put on inquiry as to the premises sought to be patented. The proofs submitted with applications for claims of this kind must show clearly the character and the extent of the improvements upon the premises.

Inasmuch as the surveyor-general has no duty to perform in connection with the entry of a placer claim of legal subdivisions, the proof of improvements must show their value to be not less than *five hundred dollars* and that they were made by the applicant for patent or his grantors. The annual expenditure to the amount of $100, required by section 2324, revised statutes, must be made upon placer claims as well as lode claims.

58. Applicants for patent to a placer claim, who are also

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in possession of a known vein or lode included therein, must state in their application that the placer includes such vein or lode. The published and posted notices must also include such statement. If veins or lodes lying within a placer location are owned by other parties, the fact should be distinctly stated in the application for patent, and in all the notices. But in all cases whether the lode is claimed or excluded, it must be surveyed and marked upon the plat; the field notes and plat giving the area of the lode claim or claims and the area of the placer separately. It should be remembered that an application which omits to include an application for a known vein or lode therein, must be construed as a conclusive declaration that the applicant has no right of possession to the vein or lode. Where there is no known lode or vein, the fact must appear by the affidavit of two or more witnesses.

59. By section 2330, it is declared that no location of a placer claim, made after July 9, 1870, shall exceed one hundred and sixty acres for any one person or association of persons, which location shall conform to the United States surveys.

60. Section 2331 provides that all placer-mining claims located after May 10, 1872, shall conform as nearly as practicable with the United States systems of public surveys and the subdivisions of such surveys, and no such locations shall include more than twenty acres for each individual claimant.

61. The foregoing provisions of law are construed to mean that after the 9th day of July, 1870, no location of a placer claim can be made to exceed one hundred and sixty acres, whatever may be the number of locators associated together, or whatever the local regulations of the district may allow; and that from and after May 10, 1872, no location made by an individual can exceed twenty acres, and no location made by an association of individuals can exceed

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one hundred and sixty acres, which location of one hundred and sixty acres, can not be made by a less number than eight *bona fide* locators; and no local laws or mining regulations can restrict a placer location to less than twenty acres, although the locator is not compelled to take so much.

62. The regulations hereinbefore given as to the manner of marking locations on the ground, and placing the same on record, must be observed in the case of placer locations so far as the same are applicable, the law requiring, however, that where placer claims are upon *surveyed* public lands the location must hereafter be made to conform to legal subdivisions thereof as near as practicable.

63. The first care in recognizing an application for patent upon a placer claim must be exercised in determining the exact classification of the lands. To this end the clearest evidence of which the case is capable should be presented.

(1) If the claim be all placer ground, that fact must be stated in the application and corroborated by accompanying proofs; if of mixed placers and lodes, it should be so set out, with a description of all known lodes, situated within the boundaries of the claim. A special declaration, such as is required by section 2333, revised statutes, must be furnished as to each lode intended to be claimed. All other known lodes are, by the silence of the applicant, excluded by law from all claim by him, of whatsoever nature, possessory or otherwise.

(2) Section 2395, revised statutes, (subdivision 7), requires the surveyor to "note in his field books the true situation of all mines, salt licks, salt springs, and mill seats which come to his knowledge;" also "all water-courses over which the lines he runs may pass." It further requires him to "note the quality of the lands." These descriptive notes are required by subdivision 8 to be incorporated in the plat by the surveyor-general.

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(3) If these duties have been performed, the public surveys will furnish a reasonable guide to the district officers and to claimants in prosecuting their applications. But experience has shown that great neglect has resulted from inattention to the law in this respect, and the regular plats are of very little value in the matter. It will, therefore, be required in the future that deputy surveyors shall, at the expense of the parties, make full examination of all placer claims surveyed by them, and duly note the facts as specified in the law, stating the quality and composition of the soil, the kind and amount of timber and other vegetation, the locus and size of streams, and such other matters as may appear upon the surface of the claim. This examination should include the character and extent of all surface and underground workings, whether placer or lode, for mining purposes.

(4) In addition to these data, which the law requires to be shown in all cases, the deputy should report with reference to the proximity of centers of trade or residence; also of well-known systems of lode deposit or of individual lodes. He should also report as to the use or adaptability of the claim for placer mining; whether water has been brought upon it in sufficient quantity to mine the same, or whether it can be procured for that purpose; and, finally, what works or expenditures have been made by the claimant or his grantors for the development of the claim and their situation and location with respect to the same as applied for.

(5) This examination should be reported by the deputy under oath to the surveyor-general, and duly corroborated; and a copy of the same should be furnished with the application for patent to the claim, constituting a part thereof, and included in the oath of the applicant.

(6) Applications awaiting entry, whether published or not, must be made to conform to these regulations, with re-

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spect to examination as to the character of the land. Entries already made will be suspended for such additional proofs as may be deemed necessary in each case.

MILL-SITES.

64. Section 2337 provides that "where non-mineral land not contiguous to the vein or lode is used or occupied by the proprietor of such vein or lode for mining or milling purposes, such nonadjacent surface ground may be embraced and included in an application for a patent for such vein or lode, and the same may be patented therewith, subject to the preliminary requirements as to survey and notice as are applicable to veins or lodes; but no location hereafter made of such nonadjacent land shall exceed five acres, and payment for the same must be made at the same rate as fixed by this chapter for the superficies of the lode. The owner of a quartz-mill or reduction works, not owning a mine in connection therewith, may also receive a patent for his mill-site, as provided in this section."

65. To avail themselves of this provision of law, parties holding the possessory right to a vein or lode, and to a piece of non-mineral land not contiguous thereto, for mining or milling purposes, not exceeding the quantity allowed for such purposes by section 2337, United States revised statutes, or prior laws, under which the land was appropriated, the proprietors of such vein or lode may file in the proper land office their application for a patent, under oath, in manner already set forth herein, which application, together with the plat and field-notes, may include, embrace, and describe, in addition to the vein or lode, such non-contiguous mill site, and after due proceedings as to notice, etc., a patent will be issued conveying the same as one claim.

66. In making the survey in a case of this kind, the lode claim should be described in the plat and field notes as "Sur. No. 37, A." and the mill site as "Sur. No. 37, B," or whatever may be its appropriate numerical designation; the

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course and distance from a corner of the mill site to a corner of the lode claim to be invariably given in such plat and field notes, and a copy of the plat and notice of application for patent must be conspicuously posted upon the mill site as well as upon the vein or lode for the statutory period of sixty days. In making the entry no separate receipt or certificate need be issued for the mill site, but the whole area of both lode and mill site will be embraced in one entry, the price being five dollars for each acre and fractional part of an acre embraced by such lode and mill site claim.

67. In case the owner of a quartz mill or reduction works is not the owner or claimant of a vein or lode, the law permits him to make application therefor in the same manner prescribed herein for mining claims, and after due notice and proceedings, in the absence of a valid adverse filing, to enter and receive a patent for his mill site at said price per acre.

68. In every case there must be satisfactory proof that the land claimed as a mill site is not mineral in character, which proof may, where the matter is unquestioned, consist of the sworn statement of two or more persons capable from acquaintance with the land to testify understandingly.

POSSESSORY RIGHT.

69. With regard to the proofs necessary to establish the possessory right to a mining claim, section 2332 provides that "where such person or association, they and their grantors, have held and worked their claims for a period equal to the time prescribed by the statute of limitations for mining claims of the state or territory where the same may be situated, evidence of such possession and working of the claims for such period shall be sufficient to establish a right to a patent thereto under this chapter, in the absence of any adverse claim."

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70. This provision of law will greatly lessen the burden of proof, more especially in the case of old claims located many years since, the records of which, in many cases, have been destroyed by fire, or lost in other ways during the lapse of time, but concerning the possessory right to which all controversy or litigation has long been settled.

71. When an applicant desires to make his proof of possessory right in accordance with this provision of law, he will not be required to produce evidence of location, copies of conveyances, or abstracts of title, as in other cases, but will be required to furnish a duly certified copy of the statute of limitation of mining claims for the state or territory, together with his sworn statement giving a clear and succinct narration of the facts as to the origin of his title, and likewise as to the continuation of his possession of the mining ground covered by his application; the area thereof; the nature and extent of the mining that has been done thereon; whether there has been any opposition to his possession, or litigation with regard to his claim, and, if so, when the same ceased; whether such cessation was caused by compromise or by judicial decree, and any additional facts within the claimant's knowledge having a direct bearing upon his possession and bona fides which he may desire to submit in support of his claim.

72. There should likewise be filed a certificate, under seal of the court having jurisdiction in mining cases within the judicial district embracing the claim, that no suit or action of any character whatever involving the right of possession to any portion of the claim applied for is pending, and that there has been no litigation before said court affecting the title to said claim or any part thereof for a period equal to the time fixed by the statute of limitations for mining-claims in the state or territory as aforesaid, other than that which has been finally decided in favor of the claimant.

73. The claimant should support his narrative of facts

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relative to his possession, occupancy, and improvements by corroborative testimony of any disinterested person or persons of credibility who may be cognizant of the facts in the case and are capable of testifying understandingly in the premises.

74. As a condition for the making of application for patent according to section 2325, there must be a preliminary showing of work or expenditure upon each location, either by showing the full amount sufficient to the maintenance of possession under section 2324 for the pending year; or, if there has been a failure, it should be shown that work has been resumed so as to prevent relocation by adverse parties after abandonment.

The "pending year" means the calendar year in which application is made, and has no reference to a showing of work at date of the final entry.

75. This preliminary showing may, where the matter is unquestioned, consist of the affidavit of two or more witnesses familiar with the facts.

PROOF OF CITIZENSHIP OF MINING CLAIMANTS.

76. The proof necessary to establish the citizenship of applicants for mining patents must be made in the following manner: In case of an incorporated company, a certified copy of their charter or certificate of incorporation must be filed. In case of an association of persons unincorporated, the affidavit of their duly authorized agent, made upon his own knowledge or upon information and belief, setting forth the residence of each person forming such association, must be submitted. This affidavit must be accompanied by a power of attorney from the parties forming such association, authorizing the person who makes the affidavit of citizenship to act for them in the matter of their application for patent.

77. In case of an individual or an association of individuals who do not appear by their duly authorized agent,

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you will require the affidavit of each applicant, showing whether he is a native or naturalized citizen, when and where born, and his residence.

78. In case an applicant has declared his intention to become a citizen or has been naturalized, his affidavit must show the date, place and the court before which he declared his intention, or from which his certificate of citizenship issued, and present residence.

79. The affidavit of the claimant as to his citizenship may be taken before the register or receiver, or any other officer authorized to administer oaths within the land district; or, if the claimant is residing beyond the limits of the district, the affidavit may be taken before the clerk of any court of record or before any notary public of any state or territory.

80. If citizenship is established by the testimony of disinterested persons, such testimony may be taken at any place before any person authorized to administer oaths, and whose official character is duly verified.

ADVERSE CLAIMS.

81. Section 2326, and the act of April 26, 1882, provide for adverse claims, fix the time within which they shall be filed to have legal effect, and prescribe the manner of their adjustment, etc.

82. An adverse mining claim must be filed with the register and receiver of the land office when the application for patent was filed, or with the register and receiver of the district in which the land is situated at the time of filing the adverse claim. It must be on the oath of the adverse claimant, or it may be verified by the oath of any duly authorized agent or attorney-in-fact of the adverse claimant, cognizant of the facts stated.

83. Where an agent or attorney-in-fact verifies the adverse claim, he must distinctly swear that he is such agent or attorney, and accompany his affidavit by proof thereof.

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84. The agent or attorney-in-fact must make the affidavit in verification of the adverse claim within the land district where the claim is situated.

85. The adverse notice must fully set forth the nature and extent of the interference or comflict; whether the adverse party claims as a purchaser for valuable consideration or as a locator; if the former, a certified copy of the original location, the original conveyance, a duly certified copy thereof, or an abstract of title from the office of the proper recorder should be furnished, or if the transaction was a merely verbal one he will narrate the circumstances attending the purchase, the date thereof, and the amount paid, which facts should be supported by the affidavit of one or more witnesses, if any were present at the time, and if he claims as a locator he must file a duly certified copy of the location from the office of the proper recorder.

86. In order that the "*boundaries*" and "*extent*" of the claim may be shown, it will be incumbent upon the adverse claimant to file a plat showing his entire claim, its relative situation or position with the one against which he claims, and the extent of the conflict. This plat must be made from an actual survey by a United States deputy surveyor, who will officially certify thereon to its correctness; and in addition there must be attached to such plat of survey a certificate or sworn statement by the surveyor as to the approximate value of the labor performed or improvements made upon the claim by the adverse party or his predecessors in interest, and the plat must indicate the position of any shafts, tunnels, or other improvements, if any such exist, upon the claim of the party opposing the application, and by which party said improvements were made: *Provided, however,* That, if the application for patent describes the claim by legal subdivisions, the adverse claimant, if also claiming by legal subdivisions, may describe his adverse claim in the same manner without further survey or plat.

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87. Upon the foregoing being filed within the sixty days as aforesaid, the register, or in his absence the receiver, will give notice in writing to *both parties* to the contest that such adverse claim has been filed, informing them that the party who filed the adverse claim will be requirud within thirty days from the date of such filing to commence proceedings in a court of competent jurisdiction to determine the question of right of possessian, and to prosecute the same with reasonable diligence to final judgment, and that, should such adverse claimant fail to do so, his adverse claim will be considered waived, and the application for patent be allowed to proceed upon its merits.

88. When an adverse claim is filed as aforesaid, the register or receiver will indorse upon the same the precise date of filing, and preserve a record of the date of notification issued thereon; and thereafter all proceedings on the applications for patent will be suspended, with the exception of the completion of the publication and posting of notices and plat, and the filing of the necessary proof thereof, until the controversy shall have been adjudicated in court, or the adverse claim waived or withdrawn.

89. Where an adverse claim has been filed and suit thereon commenced within the statutory period, and final judgment determining the right of possession rendered in favor of the applicant, it will not be sufficient for him to file with the register a certificate of the clerk of the court, setting forth the facts as to such judgment, but he must, before he is allowed to make entry, file a certified copy of the judgment, together with the other evidence required by section 2326, revised statutes.

90. Where such suit has been dismissed, a certificate of the clerk of the court to that effect, or a certified copy of the order of the dismissal, will be sufficient.

91. In no case will a relinquishment of the ground in controversy, or other proof, filed with the register or receiver, be accepted in lieu of the evidence required.

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92. Where an adverse claim has been filed, but no suit commenced against the applicant for patent within the statutory period, a certificate to that effect by the clerk of the state court having jurisdiction in the case, and also by the clerk of the circuit court of the United States for the district in which the claim is situated, will be required.

93. A party who is not an applicant for patent under section 2325, revised statutes, or the assignee of such applicant, is not entitled to make entry under said section, and in no case will the name of such party be inserted in the certificate of entry. This regulation has no reference to proceedings under section 2326.

94. Any party applying to make entry as *trustee* must disclose fully the nature of the trust and the name of the *cesqui que trust*; and such trustee, as well as the beneficiaries, must furnish satisfactory proof of citizenship; and the names of beneficiaries, as well as that of the trustee, must be inserted in the final certificate of entry.

95. No entry will be allowed until the register has satisfied himself, by a careful examination, that proper proofs have been filed upon all the points indicated in official regulations in force, and that they show a sufficient *bona fide* compliance with the laws and such regulations.

96. The administration of the mining laws as prescribed by these regulations will be, so far as applicable, adopted for, and extended to Alaska.

(1) The *ex-officio* register, receiver, and surveyor-general, while acting as such, and their clerks and deputy surveyors, will be deemed subject to the laws and regulations governing the official conduct and responsibilities of similur officers and persons under general statutes of the United States.

(2) The commissioner of the general land office will exercise the same general supervision over the execution of the laws as are or may be exercised by him in any other mineral districts.

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APPOINTMENT OF DEPUTY SURVEYORS OF MINING CLAIMS—CHARGES FOR SURVEYS AND PUBLICATIONS—FEES OF REGISTERS AND RECEIVERS, ETC.

97. Section 2334 provides for the appointment of surveyors of mineral claims, authorizes the commissioners of the general land office to establish the rates to be charged for surveys and for newspaper publications.

Under this authority of law the following rates have been established as the maximum charges for newspaper publications in mining cases:

(1) Where a daily newspaper is designated, the charge shall not exceed seven dollars for each ten lines of space occupied, and where a weekly newspaper is designated as the medium of publication five dollars for the same space will be allowed. Such charge shall be accepted as full payment for publication in each issue of the newspaper for the entire period required by law.

It is expected that these notices shall not be so abbreviated as to curtail the description essential to a perfect notice, and the said rates established upon the understanding that they are to be in the usual body-type used for advertisements.

(2) For the publication of citations in contests or hearings involving the character of lands, the charges shall not exceed eight dollars for five publications in weekly newspapers, or ten dollars for publications in daily newspapers for thirty days.

98. The surveyor-general of the several districts will, in pursuance of law, appoint in each land district as many *competent* deputies for the survey of mining claims as may seek such appointment; it being distinctly understood that all expenses of these notices and surveys are to be borne by the mining claimants and not by the United States; the system of making *deposits* for mineral surveys, as required by previous instructions, being hereby revoked as regards

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field work; the claimant having the option of employing *any* deputy surveyor within such district to do his work in the field.

99. With regard to the *platttng* of the claim and other *office work* in the surveyor-general's office, that officer will make an estimate of the cost thereof, which amount the claimant will deposit with any assistant United States treasurer, or designated depository in favor of the United States treasurer to be passed to the credit of the fund created by "individual depositors for surveys of public lands," and file with the surveyor-general duplicate certificates of such deposit in the usual manner.

100. The surveyor-general will endeavor to appoint mineral deputy surveyors, so that one or more may be located in each mining district for the greater convenience of miners.

101. The usual oaths will be required of these deputies and their assistants as to the correctness of each survey executed by them.

The duty of the deputy mineral surveyor ceases when he has executed the survey and returned the field notes and preliminary plat thereof to the surveyor-general. He will not be allowed to prepare for the mining claimant the papers in support of an application for patent, or otherwise perform the duties of an attorney before the land office in connection with a mining claim.

The surveyor-general and local land officers are expected to report any infringement of this regulation to this office.

102. The law requires that each applicant shall file with the register and receiver a sworn statement of all charges and fees paid by him for publication of notice and for survey, together with all fees and money paid the register and receiver, which sworn statement is required to be transmitted to this office for the information of the commissioner.

103. Should it appear that excessive or exhorbitant

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charges have been made by any surveyor or any publisher, prompt action will be taken with the view of correcting the abuse.

104. The fees payable to the register and receiver for filing and acting upon applications for mineral-land patents are five dollars to each officer, to be paid by the applicant for patent at the time of filing, and the like sum of five dollars is payable to each officer by an adverse claimant at the time of filing his adverse claim. (Sec. 2238, R. S., paragraph 9.)

105. All fees or charges under this law may be paid in United States currency.

106. The register and receiver will, at the close of each month, forward to this office an abstract of mining applications filed, and a register of receipts, accompanied with an abstract of mineral lands sold, and an abstract of adverse claims filed.

107. The fees and purchase money received by registers and receivers must be placed to the credit of the United States in the receiver's monthly and quarterly account, charging up in the disbursing account the sums to which the register and receiver may be respectively entitled as fees and commissions, with limitations in regard to the legal maximum.

PROCEEDINGS BEFORE THE REGISTER AND RECEIVER AND SURVEYORS GENERAL IN CONTESTS AND HEARINGS TO ESTABLISH THE CHARACTER OF LANDS.

108. The "Rules of Practice in cases before the United States district land offices, the General Land Office, and the Department of the Interior," approved August 13, 1885, will, as far as applicable, govern in all cases and proceedings arising in contests, and hearings to determine the mineral or non-mineral character of lands.

109. The only tracts of public land that will be with-

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held from entry as agricultural land on account of its mineral character, will be such as are returned by the surveyor general as mineral; and even the presumption which is supported by such return may be overcome by testimony taken at a regular hearing.

110. Hearings to determine the character of land, as practically distinguished, are of two kinds:

(1) Where lands which are sought to be entered and patented as agricultural are alleged by affidavit to be mineral, or when sought as mineral their non-mineral character is alleged.

The proceedings relative to this class are in the nature of a contest between two or more known parties.

(2) When lands are returned as mineral by the surveyor-general.

When such lands are sought to be entered as agricultural, notice must be given by publication for thirty days, with posting in the local office for the same period.

111. At the hearings under either of the aforesaid classes, the claimants and witnesses will be thoroughly examined with regard to the character of the land; whether the same has been thoroughly prospected; whether or not there exists within the tract or tracts claimed any lode or vein of quartz or other rock in place, bearing gold, silver, cinnabar, lead, tin, or copper, or other valuable deposit which has ever been claimed, located, recorded, or worked; whether such work is entirely abandoned, or whether occasionally resumed; if such lode does exist, by whom claimed, under what designation, and in which subdivision of the land it lies; whether any placer mine or mines exist upon the land; if so, what is the character thereof—whether of the shallow-surface description, or of the deep cement, blue lead or gravel deposits; to what extent mining is carried on when water can be obtained, and what the

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facilities are for obtaining water for mining purposes; upon what particular ten-acre subdivisions mining has been done, and at what time the land was abandoned for mining purposes, if abandoned at all.

112. The testimony should also show the agricultural capacities of the land, what kind of crops are raised thereon, and the value thereof; the number of acres actually cultivated for crops of cereals or vegetables, and within which particular ten-acre subdivision such crops are raised; also which of these subdivisions embrace the improvements, giving in detail the extent and value of the improvements, such as house, barn, vineyard, orchard, fencing, etc., and mining improvements.

113. The testimony should be as full and complete as possible; and in addition to the leading points indicated above, where an attempt is made to prove the mineral character of lands which have been entered under the agricultural laws, it should show at what date, if at all, valuable deposits of mineral were first known to exist on the lands.

114. When the case comes before this office, such decision will be made as the law and the facts may justify; and in cases where a survey is necessary to set apart the mineral from the agricultural land, the necessary instructions will be given to enable the proper party, *at his own expense*, to have the work done, at his option, either by United States deputy, county or other local surveyor; the survey in such case, where the claims to be segregated are vein or lode claims, must be executed in such manner as will conform to the requirements in section 2320, United States revised statutes, as to length and width and parallel end lines.

115. Such survey when executed must be properly sworn to by the surveyor, either before a notary public, officer of a court of record, or before the register or receiver, the deponent's character and credibility to be properly certified to by the officer administering the oath.

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116. Upon the filing of the plat and field notes of such survey, duly sworn to as aforesaid, you will transmit the same to the surveyor-general for his verification and approval; who, if he finds the work correctly performed, will properly mark out the same upon the original township plat in his office, and furnish authenticated copies of such plat and description both to the proper local land office and to this office, to be affixed to the duplicate and triplicate township plat respectively.

117. With the copy of plat and description furnished the local office and this office must be a diagram tracing, verified by the surveyor-general, showing the claim or claims segregated, and designating the separate fractional agricultural tracts in each 40-acre legal subdivision by the proper lot number, beginning with No. 1 in each section, and giving the area in each lot, the same as provided in paragraph 45, in the survey of mining claims on surveyed lands.

118. The fact that a certain tract of land is decided upon testimony to be mineral in character is by no means equivalent to an award of the land to a miner. A miner is compelled by law to give sixty days' publication of notice, and posting of diagrams and notices, as a preliminary step; and then, before he can enter the land, he must show that the land yields mineral; that he is entitled to the possessory right thereto in virtue of compliance with local customs or rules of miners, or by virtue of the statute of limitations; that he or his grantors have expended, in actual labor and improvements, an amount of not less than five hundred dollars thereon, and that the claim is one in regard to which there is no controversy or opposing claim. After all these proofs are met, he is entitled to have a survey made at his own cost where a survey is required, after which he can enter and pay for the land embraced by his claim.

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119. Blank forms for proofs in mineral cases are not furnished by the general land office.

THOMAS H. CARTER,
Commissioner.

Approved December 10, 1891.

JOHN W. NOBLE,
Secretary.

THE STATE.

POPULATION.

The design is to present to the world a pen picture of Arkansas as it is educationally, morally, financially and otherwise, together with a view of its resources. Men who seek homes desire to know the truth, and special pains has been taken to have it show the state as it is, and what may be reasonably expected of it under ordinary circumstances. Those who read may trust what is said, and it is confidently believed that every new comer will find greater things in the state itself than can be described or noted in this volume.

The state itself, is young, although discovered by De Soto in the sixteenth century and wandered over in turn by the Spaniards and French for more than two hundred years, it was not until the beginning of the nineteenth century that this region attracted the attention of English and American settlers. Carved out of the Louisana Purchase, it took a territorial form in 1819, and was admitted to the Union as a state in 1836.

In 1820 there were but 14,255 people within the present limits of the state. The successive decades have noted successive changes, each of which was a marked improvement over the preceding one. Emigrants have always sought the state, and the authentic figures which record their movements show that the regular migration of home seekers towards Arkansas has never been behind the nor-

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mal movement of populaton to the other new states. The growth of the state is best exhibited by the following figures:

YEAR.	POPULATION.
1820	14,255
1830	30,388
1840	97,574
1850	209,897
1860	435,450
1870	484,471
1880	802,525
1890	1,128,179

From 1820 to 1830 Arkansas outstripped all the states in the Union in increase in population, save Indiana, Illinois and Michigan. From 1830 to 1840 Michigan was the only state that excelled her in population growth. From 1840 to 1850 she kept pace with all save Iowa and Wisconsin. While from 1850 to 1860 she outstripped all the rest save Iowa, California and Texas. The strength of a country's soil and the attractiveness of its climate are best attested by the comparative ratios of those who seek it and remain with it. Judged by this standard, there must have been a remarkable vigor in the soil to place Arkansas so high in percentage when compared in population growth with the other states. The war was not strong enough to stay the growth and when peace blessed the country with prosperity, Arkansas made the remarkable record of almost doubling her population in the sixth decade of her existence. From 1870 to 1880 the population ran up from 484,471 to 802,525. The steady stream of emigration so regularly maintained through sixty years did not fall back from 1880 to 1890, when the state reached its maximum population of 1,128,179 souls. This increase during the last decade is phenomenal. Not a state in the Union of the same age maintained an increase of population from 1880 to 1890 of

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40 per cent, and yet this was the rate of increase for this queen state of southern growth. Even the empire state of Texas, with an area of five times that of Arkansas, and younger in years, was beaten in the race.

INCREASE.

The increase in Texas was 40.44 per cent; while in Arkansas the increase was 40.58 per cent. No state east of the Mississippi, except Florida, approached Arkansas in per centum of increase in population. In fact, she was outstripped by no states save Florida, Minnesota, Colorado, Kansas, Nebraska, Oregon, Northand South Dakota, Idaho, Montana, Wyoming and Washington, many of whom are too new for statistical comparisons.

Every year has not only brought a marked increase of population, but as will appear later on, this increase has always been of the vigorous thrifty kind. The wealth totals will bear out these statements.

The population of both kinds, black and white, is divided as follows: Whites, 804,658. Blacks, 309,427.

The entire native population is 1,113,915, against 14,264 foreign born. The whites with native parentage number 780,969, leaving but 23,708 of the native whites with a foreign parentage. The posisbilities of a state with such clear blood strains are beyond calculation.

The percentage of increase in native born population from 1880 to 1890 for the south central divisions of the country are shown below:

STATE.	PER CENT.
Kentucky	13.22
Tennessee	14.54
Alabama	19.59
Mississippi	14.19
Louisiana	22.66
Arkansas	40.61
Texas	40.99

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The percentage of increase for the foreign born population in the same divisions for the same period are as follows:

STATE.	PER CENT.
Kentucky	.27
Tennessee	19.92
Alabama	51.81
Mississippi	13.65
Louisiana	8.12
Texas	33.45
Arkansas	37.82

Showing a greater population movement in favor of Arkansas than of any state in this division excepting Texas.

It has been said that the negroes are not well treated in Arkansas. The best indication of the treatment accorded a race in any country is to be ascertained by a comparison of the movement of that race to or from the section in question.

The increase of colored population in the south central division from 1880 to 1890 was:

STATE.	PER CENT.
Kentucky	1.23
Tennessee	6.78
Alabama	13.16
Mississippi	14.19
Louisiana	15.51
Texas	24.10
Arkansas	46.65

This phenomenal increase of colored people can only be explained on the theory that there is a constant movement of this race from other states to Arkansas; and this constancy of movement negatives the sensational stories of bad treatment. No people will regularly turn their faces to a region where they are not accorded fair and generous treatment. And no state gives the colored people with so lavish

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a hand as does the maligned State of Arkansas. Other figures in this book attest this statement, and, like these, are incontrovertible.

It has been said that a northern-born man has little chance of success in this region. The figures do not support this assertion. From the very beginning there has been a steady accession of northern-born men to our population, and these men have been among the leaders of every movement for the development of the state. Before the war men born in Massachusetts and Pennsylvania represented the state in both houses of congress, and in nearly every state position. Since the war there has been a large influx of northern men, and these men are among the honored and distinguished citizens of the state and belong to each of the two great parties that divide the country.

Thus thousands upon thousands come to us every year from nearly every one of the older states. They come in greater ratios than to other favored localities. They come bringing their wives and children, their property and their hopes. They come to search for greater happiness, and the great percentages of increase favor the inference that they find what they seek. Let us look a little more narrowly into the resources of the state for the reasons which underlie this great percentage of population increase, with the hope that they will satisfy a still greater number and continue to turn to us the vigor, valor and virtue of every clime.

COUNTY POPULATION.

The following gives the population of the State of Arkansas in detail by counties, according to the official count of the returns made under the eleventh census, taken as of June 1, 1890. The figures for the same divisions according to the census of 1880 are also given, for purposes of comparison.

The population of the state in 1890 was 1,128,179, an

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increase of 325,654, or 40.58 per cent., since 1880, when a population of 802,525 was returned.

In every county in the state an increase is shown except in Van Buren, where the decrease is due to a decrease in territory. In Jefferson, Pulaski and Sebastian counties the largest numerical increases are found. Nineteen counties show increases of more than 50 per cent.

The following summary shows the population of each county according to the censuses of 1890 and 1880, together with the increase in number and per cent. during the decade:

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SUMMARY BY COUNTIES.

COUNTIES.	POPULATION.		INCREASE.	
	1890.	1880.	No.	PER CENT.
The state	1,128,179	802,525	325,654	40.58
Arkansas	11,432	8,038	3,394	42.22
Ashley	13,295	10,156	3,139	30.91
Baxter	8,527	6,004	2,523	42.02
Benton	27,716	20,328	7,388	36.34
Boone	15,816	12,146	3,670	30.22
Bradley	7,972	6,285	1,687	26.84
Calhoun	7,267	5,671	1,596	28.14
Carroll	17,288	13,337	3,951	29.62
Chicot	11,419	10,117	1,302	12.87
Clark	20,997	15,771	5,226	33.14
Clay	12,200	7,213	4,987	69.14
Cleburne	7,884		7,884	
Cleveland	11,362	8,370	2,992	35.75
Columbia	19,893	14,090	5,803	41.19
Conway	19,459	12,755	6,704	52.56
Craighead	12,025	7,037	4,988	70.88
Crawford	21,714	14,740	6,974	47.31
Crittenden	13,940	9,415	4,525	48.06
Cross	7,693	5,050	2,643	52.34
Dallas	9,296	6,505	2,791	42.91
Desha	10,324	8,973	1,351	15.06
Drew	17,352	12,231	5,121	41.87
Faulkner	18,342	12,786	5,556	43.45
Franklin	19,934	14,951	4,983	33.33
Fulton	10,984	6,720	4,264	63.45
Garland	15,328	9,023	6,305	69.88
Grant	7,786	6,185	1,601	25.89
Greene	12,908	7,480	5,428	72.57
Hempstead	22,796	19,015	3,781	19 88
Hot Spring	11,603	7,775	3,828	49.23
Howard	13,789	9,917	3,872	39.04
Independence	21,961	18,086	3,875	21.43
Izard	13,038	10,857	2,181	20.09
Jackson	15,179	10,877	4,302	39.55
Jefferson	40,881	22,386	18,495	82.62
Johnson	16,758	11,565	5,193	44.90

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SUMMARY BY COUNTIES—*Continued.*

COUNTIES.	POPULATION.		INCREASE.	
	1890.	1880.	No.	PER CENT.
Lafayette	7,700	5,730	1,970	34.38
Lawrence	12,984	8,782	4,202	47.85
Lee	18,886	13,288	5,598	42.13
Lincoln	10,255	9,255	1,000	10.80
Little River	8,903	6,404	2,499	39.02
Logan	20,774	14,885	5,889	39.56
Lonoke	19,263	12,146	7,117	58.60
Madison	17,402	11,455	5,947	51.92
Marion	10,390	7,907	2,483	31.40
Miller	14,714	9,919	4,795	48.34
Mississippi	11,635	7,332	4,303	58.69
Monroe	15,336	9,574	5,762	60.18
Montgomery	7,923	5,729	2,194	38.30
Nevada	14,832	12,959	1,873	14.45
Newton	9,950	6,120	3,830	62.58
Ouachita	17,033	11,758	5,275	44.86
Perry	5,538	3,872	1,666	43.03
Phillips	25,341	21,262	4,079	19.18
Pike	8,537	6,345	2,192	34.55
Poinsett	4,272	2,192	2,080	94.89
Polk	9,283	5,857	3,426	58.49
Pope	19,458	14,322	5,136	35.86
Prairie	11,374	8,435	2,939	34.84
Pulaski	47,329	32,616	14,713	45.11
Randolph	14,485	11,724	2,761	23.55
St. Prancis	13,543	8,389	5,154	61.44
Saline	11,311	8,953	2,358	26.34
Scott	12,635	9,174	3,461	37.73
Searcy	9,664	7,278	2,386	32.78
Sebastian	33,200	19,560	13,640	69.73
Sevier	10,072	6,192	3,880	62.66
Sharp	10,418	9,047	1,371	15.15
Stone	7,043	5,089	1,954	38.40
Union	14,977	13,419	1,558	11.61
Van Buren	8,567	9,565	*a*998	*a*10.43
Washington	32,024	23,844	8,180	34.31
White	22,946	17,794	5,152	28.95
Woodruff	14,009	8,646	5,363	62.03
Yell	18,015	13,852	4,163	30.05

a Decrease.

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CITY POPULATION.

The population of the thirteen cities and towns having 2,000 or more inhabitants:

CITIES AND TOWNS.	COUNTIES.	POPULATION.		INCREASE.	
		1890.	1880.	No.	PER CENT.
Little Rock city	Pulaski	25,874	13,138	12,736	96 94
Fort Smith city	Sebastian	11,311	3,099	8,212	264.99
Pine Bluff city	Jefferson	9,952	3,203	6,749	210.71
Hot Springs city	Garland	8,086	3,554	4,532	127.52
Helena city	Phillips	5,189	3,652	1,537	42.09
Eureka Springs city	Carroll	3,706	3,984	*a*278	*a*6.98
Texarkana city (*b*)	Miller	3,528	1,390	2,138	153.81
Fayetteville city	Washington	2,942	1,788	1,154	64.54
Camden city	Ouachita	2,571	1,503	1,068	71.06
Arkadelphia town	Clark	2,455	1,506	949	63.01
Van Buren city	Crawford	2,291	1,029	1,262	122.64
Batesville town	Independence	2,150	1,264	886	70.09
Jonesboro town	Craighead	2,065	.....	2,065	.....

a Decrease.
b Total for Texarkana City, in Miller county, Arkansas, and Bowie county, Texas, 6,380.

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COUNTY POPULATION BY COLOR.

STATES, TERRITORIES AND COUNTIES.	AGGREGATE WHITE.		TOTAL COLORED.	
	Males.	Females.	Males.	Females.
Arkansas	4,221	3,678	1,776	1,757
Ashley	3,323	3,104	3,445	3,423
Baxter	4,414	4,095	9	9
Benton	13,882	13,740	40	54
Boone	7,871	7,852	46	47
Bradley	2,574	2,534	1,461	1,403
Calhoun	2,397	2,150	1,396	1,324
Carroll	8,695	8,510	36	47
Chicot	731	661	5,247	4,780
Clark	7,377	6,824	3,385	3,411
Clay	6,583	5,573	27	17
Cleburne	4,045	3,787	25	27
Cleveland	4,263	3,771	1,748	1,580
Columbia	6,482	6,098	3,643	3,670
Conway	6,059	5,729	3,997	3,674
Craighead	6,123	5,383	253	266
Crawford	10,007	9,403	1,159	1,145
Crittenden	1,245	805	6,297	5,593
Cross	1,621	2,181	1,500	1,391
Dallas	3,076	2,950	1,621	1,646
Desha	1,160	959	4,377	3,828
Drew	3,893	3,594	5,018	4,847
Faulkner	7,843	7,151	1,745	1,603
Franklin	9,967	9,289	339	339
Fulton	5,673	5,225	36	50
Garland	6,635	5,912	1,312	1,469
Grant	3,526	3,224	536	500
Greene	6,858	5,889	105	56
Hempstead	6,178	5,641	5,541	5,436
Hot Spring	5,367	4,987	656	593
Howard	5,536	5,198	1,555	1,500
Independence	10,561	9,820	795	785
Izard	6,565	6,211	126	136
Jackson	5,885	4,964	2,210	2,120
Jefferson	6,178	4,773	15,466	14,464
Johnson	8,364	7,761	351	282
Lafayette	1,724	1,433	2,366	2,177
Lawrence	6,463	5,688	443	390

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COUNTY POPULATION BY COLOR.

STATES, TERRITORIES AND COUNTIES.	AGGREGATE WHITE.		TOTAL COLORED.	
	Males.	Females.	Males.	Females.
Lee	2,596	2,095	7,438	6,757
Lincoln	1,928	1,856	3,443	3,028
Little River	2,566	2,336	1,963	2,038
Logan	10,236	9,410	567	561
Lonoke	5,970	5,308	4,176	3,809
Madison	8,854	8,490	27	31
Marion	5,303	5,055	15	17
Miller	4,328	3,819	3,359	3,207
Mississippi	3,089	2,646	3,213	2,688
Monroe	3,275	2,849	4,822	4,390
Montgomery	3,903	3,718	148	154
Nevada	5,412	5,114	2,159	2,147
Newton	5,096	4,847	6	1
Ouachita	4,259	3,817	4,548	4,409
Perry	4,464	2,133	451	490
Phillips	3,076	2,619	10,063	9,583
Pike	4,115	3,938	235	249
Poinsett	2,057	1,669	315	231
Polk	4 684	4,553	24	22
Pope	9,253	8,584	846	775
Prairie	3,750	3,261	2,282	2,081
Pulaski	13,353	11,976	11,351	10,649
Randolph	7,319	6,571	286	309
St. Francis	3,022	2,519	4,200	3,802
Saline	5,080	4,747	746	738
Scott	6,520	6,081	22	12
Searcy	4,935	4,695	21	13
Sebastian	15,470	13,928	1,940	1,862
Sevier	4,513	4,103	727	729
Sharp	5,233	5,007	93	85
Stone	3,564	3,366	55	58
Union	4,339	4,266	3,131	3,241
Van Buren	4,309	4,096	79	83
Washington	15,758	15,256	475	535
White	10,478	9,901	1,322	1,245
Woodruff	3,490	2,962	3,901	3,656
Yell	8,548	8,104	708	655

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CITY POPULATION BY COLOR.

CITIES.	AGGREGATE WHITE.		TOTAL COLORED.	
	Males.	Fe. males.	Males.	Fe-males.
Fort Smith	4,654	4,025	1,345	1,287
Hot Springs	3,199	2,642	1,051	1,194
Little Rock	8,336	7,778	4,626	5,134
Pine Bluff	3,021	2,354	2,159	2,418

GROWTH IN WEALTH.

In 1838 the entire taxed wealth of the state was, in round numbers, but $15,000,000, or about $1,000 per capita of population. In 1860 this had grown until the Auditor's books showed an aggregate of $122,000,000, or about $300 per capita. The war closed showing a taxed valuation of about $38,000,000. This loss of more than $80,000,000 in property, besides the other ravages of war, was a tremendous blow at the energies and hopes of the people, and it was believed by many that it would be half a century before the people would regain their former estate and give to the world a wealth value equal to that possessed by the people at the beginning of the war. But the recuperative power of the people, backed by the remarkable natural resources of the state, have enabled them in less than a quarter of a century not only to regain the full taxed value of 1860, but to increase it 50 per cent. The assessment of all the real and personal property of the state foots up today almost $200,000,000, or about $175 per capita.

This statement of the assessed wealth of the state shows that Arkansas has not only kept step with her own ratio of growth as indicated by the decades prior to the war, but has also kept step with the whole Union. The whole

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wealth of the country increased from $16,902,993,543 in 1880 to $25,246,589,804, an increase of $7,346,596,261, or 43.46 per cent.

Arkansas increased from $86,409,364 in 1880 to $174,737,755 in 1890, an increase of $88,228,391, or 102 per cent. That is to say, the increase of taxed wealth during the last ten years is greater than the whole amount of property on hand in 1880. Thus, while the population has increased more than 40 per cent, the wealth has increased more than 100 per cent, and both these elements indicate a condition of health in our industries that invites the work, the wealth, and the wisdom, of other sections to our state.

Of states admitted to the Union prior to 1860, Arkansas outstripped them all in percentage of wealth increase during the last decade, except Florida, Minnesota and Texas.

TOTALS OF ASSESSED PROPERTY.

1892.	
Total personal property	$ 72,379,406
Total real property	102,449,430
Total	$174,828,836
1893.	
Total personal property	$ 72,716,742
Total real property	100,809,742
Total	$173,526,484

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TOTALS OF ASSESSED PROPERTY, BY COUNTIES.

	COUNTIES.	Total Personal Property.		Total Real Estate.		Grand Total Real and Personal Property.	
		Valuation, 1892.	Valuation, 1893.	Valuation, 1892.	Valuation, 1893.	Valuation, 1892.	Valuation, 1893.
1	Arkansas	$ 1,105,270	$ 1,006,760	$ 1,694,670	$ 1,634,740	$ 2,799,940	$ 2,641,500
2	Ashley	634,271	768,262	1,366,657	1,230,996	2,000,928	1,999,258
3	Baxter	503,481	490,342	505,231	511,318	1,008,712	1,001,660
4	Benton	1,569,116	1,591,716	2,047,362	2,122,058	3,616,478	3,713,774
5	Boone	907 795	835,589	1 090,531	1,075,446	1,998 826	1,991,035
6	Bradley	551,076	541,552	679,312	677,832	1,230,388	1,219 384
7	Calhoun	494,572	517.361	555,648	611,324	1,050,220	1,128,685
8	Carroll	931,416	1,002,123	1,564,110	1,585,723	2,495,526	2,588,846
9	Chicot	416,854	330,674	875,091	725,484	1,291,945	1.056,158
10	Clark	1,504,197	1,648,210	1,144,339	1,291,632	2,648,536	2,939,842
11	Clay						
12	Cleburne	367,372	350,683	467,021	448,206	834,393	798,889
13	Cleveland	741.698	710,038	700.459	698,859	1,442.157	1.408,897
14	Columbia	1,236.546	1,298.996	1,023,780	1,046,316	2,260.326	2,345,312
15	Conway	968,093	1.004,650	1,774,534	1,581,994	2,742.627	2.535.744
16	Craighead	1,657.295	1,651,747	1.674 506	1,701,877	3,331,801	3.353,624
17	Crawford	894,386	1,266,420	1,956,714	1.572,828	2,851,100	2,839,248
18	Crittenden	1,171,544	1,497,773	1,383,546	1.327,910	2,555,090	2,825,683
19	Cross	1,040,443	1,019.989	983,390	1,046,055	2,023,833	2.066,044
20	Dallas	619,143	667,365	785,700	699.535	1,404,843	1,366.900
21	Desha	287,246	253,997	1,157,532	994,485	1,444.778	1,248,482
22	Drew	1,114,149	1,114.955	1,159,495	1,158,130	2,273,644	2,273 085
23	Faulkner	991,278	1,021.584	1,448,501	1,511.035	2.439.779	2,532,619
24	Franklin	1,189,454	1,208,797	1,605,292	1.488,340	2,794.746	2,697,137
25	Fulton	799,806	825,148	677,192	722.793	1,476.998	1,547,941
26	Garland	1,172,555	1,174,432	2,901,394	3,154 420	4.073,949	4,328,852
27	Grant	363,209	343,749	650,180	584,300	1.013,389	928.049
28	Greene	1 179,632	1,198,872	1,153,020	1,164,825	2.332,652	2,363,697
29	Hempstead	1,539,656	1,507,308	1,615,911	1,558,206	3.155,567	3,065,514
30	Hot Spring	1,057,022	1,104.786	744,471	701,548	1,801,493	1 806,334
31	Howard	612,700	602,267	929.494	838,912	1,542,194	1,441,179
32	Independence	1,712.278	1,735,818	2,495.146	2,473 554	4.207,424	4,209,372
33	Izard	755,534	719,478	807,700	769,678	1.563,234	1,489,156
34	Jackson	1,352,752	1,462,691	1,981,365	1,879,244	3,334,117	3,341,935

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TOTALS OF ASSESSED PROPERTY, BY COUNTIES—*Continued*

	COUNTIES.	TOTAL PERSONAL PROPERTY.		TOTAL REAL ESTATE.		GRAND TOTAL REAL AND PERSONAL PROPERTY.	
		Valuation, 1892.	Valuation, 1893.	Valuation, 1892.	Valuation, 1893.	Valuation, 1892.	Valuation, 1893.
35	Jefferson	$ 2,5[illegible]3.504	$ 2,368,690	$ 4,529,410	$ 4,807,670	$ 7,042,914	$ 6,676 360
36	Johnson	1,106,160	1,080,681	1 345,707	1,269,775	2,245,867	2,350,456
37	Lafayette	604.116	665 831	725,695	622,660	1,329 811	1,288,491
38	Lawrence	1,584,447	1,699,295	1,227,709	1,282,186	2,812,156	2,981 481
39	Lee	790,563	691,647	1,566 420	1,468,684	2,356,983	2,160,331
40	Lincoln	435,500	476,5[illegible]2	1,243,350	1,058,036	1,678,850	1,534,558
41	Little River	458,639	444,786	588,358	807,078	1,046,997	1,251 864
42	Logan	1,055.674	1,009,170	1,612,290	1,574,306	2,667,964	2,583,476
43	Lonoke	1,316,193	1,180 706	2,297,111	2,088,513	3,613,304	3,269,219
44	Madison	940,968	930,089	829,887	875,241	1,770,855	1,805,330
45	Marion	579 591	555,031	604,639	634,234	1,184,230	1,189,265
46	Miller	1,474,160	1,478 950	1,646,560	1,691,720	3,120,720	3,170,670
47	Mississippi	409 803	405 461	1,209,010	1,212,563	1,618,813	1,618.024
48	Monroe	882,276	1,010,397	1,116,198	1,593,769	1,998,474	2,604,166
49	Montgomery	276,309	269,687	228,780	222,110	505,179	491,797
50	Nevada	1,023,488	1,084,305	996,796	969,048	2,020.284	2,053,358
51	Newton	402,995	442,201	332,630	342,319	735,625	784,520
52	Ouachita	1,682 279	1,797.262	1,1[illegible]2,251	1,217,841	2,864,530	3,015,103
53	Perry	254,364	246,384	672,585	660,168	926,949	906,502
54	Phillips	1,229,041	1,081.610	2,647.657	2,613.995	3,876,698	3,695,605
55	Pike	338,266	333,730	417,365	407,184	755,631	740,914
56	Poinsett	765,787	774.268	812,529	1,007,087	1,578,316	1,781,355
57	Polk	397.270	374,196	292,493	283 539	689.763	657,735
58	Pope	1.240.117	1,231,267	1,478,360	1,356.959	2,718,477	2,588,226
59	Prairie	893.336	768.693	1,413,483	1,387,917	2,306,819	2,156,610
60	Pulaski	4,757.038	4 504,093	9,997.042	10,001,225	14,754,080	14.505.318
61	Randolph	651,883	733.131	815.984	813,456	1,467,817	1,546.587
62	Saline	838.770	863.810	785,364	871,180	1,624,134	1,734.990
63	Scott	529.266	581.599	724,505	734,456	1,253,771	1 266,055
64	Searcy	507,538	494,025	548,375	544,033	1,055,913	1,038 958
65	Sebastian	2,184.308	1,942,031	4,671.719	4,472.154	6,856,022	6,414,185
66	Sevier	548.385	541.794	589,125	599,917	1,137,460	1,141.711
67	Sharp	744,274	789.009	612,148	632.095	1.356.422	1.421,104
68	St. Francis	800.729	774,920	1,790,160	1,658,775	2,590,899	2,433,695

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TOTALS OF ASSESSED PROPERTY, BY COUNTIES—*Continued.*

	COUNTIES.	Total Personal Property.		Total Real Estate.		Grand Total Real and Personal Property.	
		Valuation, 1892.	Valuation, 1893.	Valuation, 1892.	Valuation, 1893.	Valuation, 1892.	Valuation, 1893.
69	Stone	$ 328 877	$ 329,180	$ 389.532	$ 371 890	$ 713.409	$ 701.070
70	Union	642,.32	674 288	795.597	821.446	1 437 ?29	1,495.7?4
71	Van Buren	?89.755	368 045	304.315	311.010	694 070	679.055
72	Washington	2.038.865	2,099.206	2.321 199	2.290,265	4,360 064	4 395 471
73	White	1,853.524	1.286,756	2.?99.?84	2.537,070	4 053,358	3,823,?33
74	Woodruff	932 ?02	924.194	1.288 105	1.250,15?	2.220 507	2 174,352
75	Yell	1,059,890	985,720	1,499 860	1,399.400	2,55?,7?0	2.385,120
	Total	$ 72 379 406	$ 72,716 742	$102,449 480	$ 100 809,742	$174,82? ?86	$ 173.526,484

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STATEMENT OF THE AVERAGE ASSESSED PRICE OF THE LANDS AND VALUE PER HEAD OF HORSES, MULES AND CATTLE IN EACH COUNTY IN THE STATE AS SHOWN BY THE ABSTRACT OF TAX BOOKS OF 1893.

COUNTIES.	Lands per Acre.	Horses.	Mules.	Cattle.
Arkansas	$2 53	$35 90	$47 40	$5 60
Ashley	2 08	43 86	59 71	6 43
Baxter	3 44	44 67	56 05	6 17
Benton	3 87	31 74	36 88	6 03
Boone	3 91	42 32	48 84	5 92
Bradley	1 67	46 20	65 11	5 86
Calhoun	1 86	41 44	59 90	6 22
Carroll	3 90	40 63	50 14	6 64
Chicot		31 71	49 75	6 30
Clark	1 84	37 07	50 70	5 21
Clay				
Cleburne	2 00	41 00	51 00	5 40
Cleveland		40 50	62 50	5 80
Columbia	1 70	40 50	55 50	5 85
Conway	3 44	37 67	49 20	5 40
Craighead	2 86	39 92	55 31	6 45
Crawford		32 10	45 80	5 52
Crittenden	3 36	34 78	44 60	7 33
Cross	2 27	47 75	59 32	7 56
Dallas	1 40	47 50	59 00	5 65
Desha		34 75	41 80	5 75
Drew	1 90	38 25	41 80	5 30
Faulkner	5 82	36 55	52 06	4 91
Franklin	3 85	43 43	52 50	5 65
Fulton	3 03	45 48	53 54	6 39
Garland	3 73	36 04	48 43	5 43
Grant	1 56	41 28	57 48	5 36
Greene	2 57	51 39	49 31	6 62
Hempstead		38 87	55 20	5 53
Hot Spring	1 85	40 20	53 00	6 70
Howard	3 07	37 40	52 00	5 46
Independence	4 05	43 19	53 25	5 77
Izard	2 80	52 95	73 45	5 95
Jackson	3 87	36 53	37 92	5 34
Jefferson	3 81	34 09	46 97	5 69
Johnson	3 50	39 85	52 33	5 54
Lafayette	1 76	33 17	49 09	7 90
Lawrence	2 95	47 80	49 50	5 71

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STATEMENT.—*Continued.*

COUNTIES.	Lands per Acre.	Horses.	Mules.	Cattle.
Lee	$3 18	$38 35	$48 68	$6 26
Lincoln	3 35	37 30	54 97	5 49
Little River	2 24	30 43	50 38	5 94
Logan	4 11	45 07	59 97	6 40
Lonoke	4 22	33 84	43 99	4 12
Madison	3 10	40 98	42 08	6 20
Marion	3 51	45 40	53 98	5 91
Miller		34 68	51 25	6 97
Mississippi	2 30	44 15	49 79	5 41
Monroe	3 48	32 62	45 19	5 49
Montgomery	1 62	35 70	47 20	5 17
Nevada	2 13	40 41	62 00	5 58
Newton	4 25	35 04	47 20	5 49
Ouachita	1 64	39 20	62 11	7 01
Perry	1 81	37 53	54 47	5 37
Phillips	3 59	35 60	43 58	5 70
Pike	1 89	37 06	58 10	5 35
Poinsett	2 49	44 35	52 74	6 11
Polk	2 36	36 15	50 60	5 65
Pope	3 65	39 95	49 10	5 13
Prairie — S. Dist.	3 35	35 67	47 13	5 22
Prairie — N. Dist.	2 55	38 96	44 85	5 10
Pulaski	3 52	34 02	40 03	6 17
Randolph	2 13	42 14	46 90	5 98
Saline	2 12	41 95	57 20	5 60
Scott	2 81	38 20	53 97	5 40
Searcy	4 69	47 39	62 88	5 82
Sebastian — Ft. Smith Dis	25 93	34 45	42 98	7 15
Sebastian — Greenw'd Dis	3 63	43 85	43 45	5 01
Sevier	2 62	41 38	71 52	6 22
Sharp	2 09	47 57	55 95	5 50
St. Francis	4 08	43 61	55 79	6 18
Stone	3 66	44 35	57 15	5 66
Union	1 40	34 52	56 44	5 60
Van Buren	2 21	34 52	53 34	5 37
Washington	3 58	37 26	45 22	6 73
White	3 07	41 00	49 69	
Woodruff	3 12	30 57	37 99	4 05
Yell	3 18	39 93	39 58	5 60

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Statement of the number of acres of land in each county subject to taxation, and the valuation thereof, the valuation of the town or city lots, and of personal property, for the years 1892 and 1893.

	LAND.				TOWN LOTS.		POLLS.		
	No. of Acres 1892.	No. of Acres 1893.	Valuation 1892.	Valuation 1893.	Valuation 1892.	Valuation 1893.	Number 1892.	Number. 1893.	Number 1892.
1 Arkansas	546,876	548.484	$1,405,430	$ .387,990	$ 289.240	$246,750	2,720	2,684	4,940
2 Ashley	49,964	550,960	1,273.235	1.149,331	93,422	81.665	2,803	2,606	3,094
3 Baxter	118,628	135.901	4 4,181	466,991	41,050	44,327	1,637	1.676	1,877
4 Benton	393.371	416 648	1,56.,791	1.613.137	485.571	508,921	5.507	5,671	9,319
5 Boone	220.788	232,971	933 564	930.970	156,967	144.476	2.967	2,857	5,177
6 Bradley	328,321	346.99	596.232	578.682	83 080	99,1 0	1,561	1,642	1,684
7 Calhoun	300,939	318 852	547,085	591,449	18 560	19.875	1,534	1.541	1,259
8 Carroll	224.973	234,620	900,270	926 583	663,840	660,140	3,295	3 170	4,565
9 Chicot			843 450	69 .389	31,641	29,095	,745	2,491	1.393
10 Clark	491.600	500.000	857.606	924 412	286,733	367,220	3,883	4.023	3,291
11 Clay	No report from clerk.								
12 Cleburne	159,010	17 ,560	391,367	375 231	75.654	72.975	1 679	1.688	1,709
13 Cleveland			64,.029	634,398	59 430	64.461	2.2.7	2,218	1,784
14 Columbia	469.977	472,443	816 246	824,032	207,534	2..2.284	3,986	4 073	2.888
15 Conway	353.224	356,460	1.423,613	1 2.7.201	350.921	393,893	3,943	3,877	2,.06
16 Craighead	407,896	409,389	1.221.111	1,191.275	453,.95	510,.02	2,576	2 771	3.084
17 Crawford			1,466,445	,054,198	430.269	518.630	3,810	3,728	2,976
18 Crittenden	365.686	385,321	1.343 716	1,292 760	39,830	35,150	3,185	3.587	870
19 Cross	379 842	377.842	849 075	856.820	134.315	189.235	1,959	2,014	1,337
20 Dallas	378,685	383,194	609,808	537,789	175.892	161,746	1.857	1,900	1.437
21 Desha			*1,054,158	*994.485	103.374		3.029	2,813	1,079
22 Drew	491,503	491 503	939 865	935 555	219,630	222.575	3,353	3,593	2,934
23 Faulkner	375.795	382.057	1,250 360	1.288,330	198,141	222.705	4,109	4,166	3,345
24 Franklin	400.655	343,376	1.417,684	1,323,057	187 608	165,283	3, 64	3,623	4,220
25 Fulton	194 674	196.484	527.185	595,493	150,007	127,300	2,183	2,198	2,579
26 Garland	162,412	179.530	512.998	670.710	2,383,396	2,483,710	3,180	3,587	1.787
27 Grant	361,118	351,893	630 940	565,830	19,240	18,470	1.492	1,502	1,506
28 Greene	333,131	331,418	870,560	855,875	282,460	308,950	2,491	2.591	2 771
29 Hempstead	445 000		1 244,814	1,152 950	371.097	405 256	4,399	4.415	3,544
30 Hot Spring	305.387	312,798	740,703	598,873	103,768	102.675	2.053	2,043	1,771
31 Howard	263 851	286,162	784,655	725,412	144,839	113.500	2,547	2,563	2,289
32 Independence	476.629	467,316	1,953 220	1,932.283	541,926	541 271	4.305	4,290	4.075
33 Izard	251,900	265.775	763,540	727 578	44.160	42 100	2.524	2,416	2,326
34 Jackson	346,397	346,397	1,433,890	1,343,004	547,475	536,240	3,247	3,347	2,978

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Statement of the number of acres of land in each county subject to taxation, and the valuation thereof, the valuation of the town or city lots, and of personal property, for the years 1892 and 1893:

		LAND.				TOWN LOTS.		POLLS.		
		No of Acres 1892.	No. of Acres 1893.	Valuation. 1892.	Valuation. 1893.	Valuation 1892.	Valuation. 1893.	Number 1892.	Number 1893.	Number 1892.
35	Jefferson	553,709	533.680	$2,218.470	$2,038,880	$2,310.940	$2,263,790	8,851	8,139	3,074
36	Johnson	290,565	292,202	1,093.792	1,021,829	251.915	247,946	3.373	3,418	2,933
37	Lafayette	273.427	301.779	635,895	537 400	89.800	85.260	1.779	1.673	1,164
38	Lawrence	362,118	362.118	998,316	1,034,416	229,393	247.770	2,870	3.001	2,971
39	Lee	.....	384,207	1,345,700	1,232,375	220.720	236,309	4,118	3 785	2,177
40	Lincoln	328,540	311,745	*1,229,245	1,043,886	14.105	14.150	2,583	2,280	2,024
41	Little River	343 046	342.133	575.585	767,587	12,773	39,491	2,072	2 050	2,492
42	Logan	.....	348,109	1,454 211	1,412,998	158,079	161,808	3,598	3,872	4,388
43	Lonoke	442.457	447.108	2,071,968	2,088,513	225.143	.....	4,900	4.499	3.636
44	Madison	261,450	271,652	797,308	841.700	32,579	83,541	3 328	3,290	3,847
45	Marion	156,474	170,744	604,639	597,325	.....	36,909	1 976	1,963	2,183
46	Miller	.....	.....	779,980	756,360	866,580	935,360	2.926	3,014	2,904
47	Mississippi	496 109	499.040	1,209,010	1,139,013	.....	73,550	2,282	2,484	1,424
48	Monroe	342,324	352,965	874,517	1,232,011	241,681	361.758	2,495	2,531	1,857
49	Montgomery	120.456	126,800	211,782	205,790	16,998	16.320	1,547	1,613	1,697
50	Nevada	405.807	391,8-5	816,205	789 532	180,591	179,516	2,947	3,147	2,632
51	Newton	97,439	80,405	332.630	342,319	.....	.....	1,888	2,048	2,103
52	Ouachita	421.803	431,738	682 136	703,426	500,115	514,415	3,988	3,689	1,929
53	Perry	193,300	352.428	672 585	638.482	.....	21.685	1.208	1,197	1,119
54	Phillips	.....	423.040	1,525.612	1,522.122	1,122,045	1,091,873	5 173	5,277	2,817
55	Pike	.....	215.0.6	412.185	407.184	5.180	.....	1,547	1,528	1,702
56	Poinsett	399 516	407,417	812 529	1,007,087	.....	.....	815	998	789
57	Polk	108.540	111.898	280.042	272,631	12,451	10.908	1,722	1,750	1.955
58	Pope	300,000	309.000	1,262.135	1,134,880	216 225	222,079	3,904	4,022	3,400
59	Prairie	368.8 3	408.666	1,237.789	1,219,641	175,694	168,276	2.450	2,407	2.788
60	Pulaski	404.856	412 909	1,630,605	1,474,515	8,366,737	8 52 .710	12,876	12,733	3,861
61	Randolph	307,999	309.874	754.755	762.495	51,229	50.961	2.669	2.865	3,280
62	Saline	324.510	324.995	711,894	794.716	73.470	76,470	2,533	2,616	1,793
63	Scott	251 277	251,345	699.900	706.271	24,805	28,185	2.318	2,259	2,767
64	Searcy	109,235	112,879	531.725	5.9.908	16,650	15 025	1,757	1,888	1,896
65	Sebastian	51.054	338,766	1,981.705	1,648.984	2,690,014	2,823.170	6,244	6,062	5,636
66	Sevier	205,910	214,431	573,100	564,435	16 025	35.422	1.931	1,973	2,345
67	Sharp	225,494	228,824	570.110	579,739	42,038	52,356	2.007	2.104	2,261
68	St. Francis	326,456	342,238	*1,523,595	1,398,090	266,565	260,685	3,0.9	3,088	1,759

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Statement of the number of acres of land in each county subject to taxation, and the valuation thereof, the valuation of the town or city lots, and of personal property, for the years 1892 and 1893.

		LAND.				TOWN LOTS.		POLLS.		.
		No. of Acres 1892.	No. of Acres 1893.	Valuation 1892.	Valuation 1893.	Valuation 1892.	Valuation 1893.	Number 1892	Number 1893.	Number 1892.
69	Stone	89,081	99,490	$ 378,642	$ 360,850	$ 10,890	$ 11,040	1,327	1,280	1,180
70	Union	509,916	531,953	745,705	748,124	49,832	73,322	3,051	3 884	2,213
71	Van Buren	12 359	129,957	285.344	297,360	18,970	13,660	1.737	1,749	1,637
72	Washington	467,245	474,334	1,728.835	1,696,750	592.364	599,515	4,167	6.197	9.465
73	White	653.461	653,545	2.136,628	2,011,141	563,206	525,936	4.857	5,052	5.198
74	Woodruff	354,724	356,427	1,139,035	1.111,380	149 070	138.778	3,452	3.144	2.413
75	Yell	367,434	366,686	1,237,960	1,160,700	261,900	238.700	4,000	3,909	4.357
	Totals	20.525,674	$22,783,333	$72,933,693	$70,801,973	$29,515,737	$30,007,769	228,506	231,637	204.555

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LIVE STOCK, ETC., AS ASSESSED IN 1893.

	NUMBER.	VALUATION.
Horses	216,396	8,092,599
Mules	138,313	6,926,408
Cattle	891,007	5,145,742
Sheep	231,121	247,321
Hogs	1,179,986	1,699,561
Carriages and wagons	115,196	2,201,967

DEBT.

By reference to volume 1 of Preliminary Results of the Eleventh Census Bulletins it will be found that Arkansas shows but little black in the symbols adopted by the government to represent the indebtedness of the states and counties of the general government. A careful analysis of the tables and argument so ably set out in that volume will show a remarkable decrease of state and county indebtedness in Arkansas between the years 1880 and 1890. This decrease represents actual liquidation of genuine indebtedness and does not spring from any decrease growing out of adjudged fraudulent bonds.

When it is known that the power to tax is limited to a fixed constitutional rate, and when it is further considered that nearly all of this rate is needed to meet the ordinary expenses of county government, the tremendous value of this decrease of county indebtedness will become more apparent. It indicates (1), a fixed and unalterable determination to pay; (2), a steady increase of resources; (3), daring, vigorous body of citizens.

Here are the figures as to the indebtedness of the counties:

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Bonded debt, 1880	$1,691,689
Bonded debt, 1890	1,030,631
Decrease	$ 661,058
Floating debt, 1880	$1,444,060
Floating debt, 1890	561,951
Decrease	$ 882,109
Gross debt, 1880	$3,135,749
Gross debt, 1890	1,592,582
Decrease	$1 543,167

This shows a decrease of *49 per cent.* in ten years of county indebtedness.

The same volume shows that an amount equal to $665,327 of available resources is in the various county treasuries of the state. This is equivalent to saying that the entire indebtedness of the counties is at present less than $1,000,000, and is steadily decreasing.

In fact, the large majority of counties are out of debt. Their scrip is at par, and they have begun a system of county improvements based upon cash payments. Elegant county buildings are going up in many counties, paid out of revenues already collected, and which entail no debt nor interest.

The following line from page 13 of the volume referred to will show the exact state of our county affairs:

ARKANSAS.

Gross debt	$1,592,582
Sinking fund	22,567
Cash on hand	642,760
Total resources	665,327
Net debt	927,255
Annual interest	64,868

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The counties of Texas show a larger sum in the treasury than those of any other southern state, while Arkansas has the next largest.

But if the total indebtedness of the southern states be considered together, it will be seen that Arkansas leads the whole section as to gross county debt, in comparison with available resources. In fact, Arkansas stood in the van in 1880 for both bonded and floating county indebtedness. From 1880 to 1890 she decreased her bonded indebtedness 39 per cent., and her floating indebtedness 61 per cent., and her gross indebtedness 49 per cent. While the whole southern section increased its gross county indebtedness 3 per cent., Arkansas has decreased hers full one-half.

Total state debt of Arkansas, 1894	$4,831,282 50
Of this sum the United States treasurer holds, as assets of the Smithsonian institute and as trustee for Indian tribes	2,654,702 50
The United States is indebted to the State of Arkansas in a sum equal to	2,654,702 50
Which leaves the real debt of the state	2,176,580 00

The per capita debt of the 33 states and territories appears in the following comparative statement, as per census 1890, under the head of "Statistics of Farms, Homes and Mortgages:"

Alabama	$ 26
Arizona	39
Arkansas	13
California	200
Colorado	206
Connecticut	107
Delaware	96
District of Columbia	226
Florida	40
Georgia	15
Idaho	38

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Illinois	100
Indiana	51
Iowa	104
Kansas	176
Maine	49
Massachusetts	144
Minnesota	152
Missouri	80
Montana	66
Nebraska	126
Nevada	48
New Hampshire	50
New Mexico	43
New York	268
Oregon	73
Pennsylvania	117
Rhode Island	106
Tennessee	23
Utah	39
Vermont	84
Wisconsin	72
Wyoming	82

In the ratio between the debt and the true value of all taxed real estate the states and territories compare as is shown below:

	PER CENT.
Alabama	15.44
Arizona	4.78
Arkansas	6.70
California	15.90
Colorado	13.08
Connecticut	16.44
Deleware	15.92
District of Columbia	35.86
Florida	8.49

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Georgia	7.15
Idaho	4.33
Illinois	12.36
Indiana	9.79
Iowa	16.64
Kansas	26.83
Maine	13.95
Massachusetts	19.32
Minnesota	20.69
Missouri	15.82
Montana	4.78
Nebraska	20.03
Nevada	4.59
New Hampshire	12.12
New Mexico	11.99
New York	30.62
Oregon	7.52
Pennsylvania	18.91
Rhode Island	11.92
Tennessee	8.80
Utah	7.14
Vermont	22.05
Wisconsin	11.91
Wyoming	18.82

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COUNTIES AND THEIR AREA.

Arkansas	1,062	Lee	606
Ashley	927	Lincoln	536
Baxter	545	Little River	547
Benton	891	Logan	642
Boone	672	Lonoke	762
Bradley	755	Madison	891
Calhoun	575	Marion	634
Carroll	659	Miller	603
Chicot	760	Mississippi	696
Clark	905	Monroe	834
Clay	568	Montgomery	636
Cleburne	558	Nevada	861
Cleveland	693	Newton	838
Columbia	825	Ouachita	732
Conway	493	Perry	560
Craighead	668	Phillips	650
Crawford	582	Pike	620
Crittenden	614	Poinsett	720
Cross	672	Polk	935
Dallas	676	Pope	795
Desha	733	Prairie	658
Drew	802	Pulaski	883
Faulkner	623	Randolph	622
Franklin	672	St. Francis	612
Fulton	649	Saline	622
Garland	622	Scott	930
Grant	617	Searcy	768
Greene	591	Sebastian	600
Hempstead	742	Sevier	547
Hot Spring	626	Sharp	570
Howard	629	Stone	619
Independence	736	Union	1,138
Izard	547	Van Buren	998
Jackson	619	Washington	927
Jefferson	840	White	1,137
Johnson	612	Woodruff	577
Lafayette	497	Yell	936
Lawrence	574		

Total, 53,045 Sq Miles.

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SUMMARY OF RAILROAD STATISTICS.

	Miles	Value.
Total number of miles main track	2,164 25	
Total number of miles of side track	278 64	
Aggregate value of main track		$14 452 663 00
Aggregate value of side track		471 952 00
Aggregate value of rolling stock		2,9.6.348 00
Aggregate value of buildings		341,313 00
Aggregate assessed value of all property		$18 192.276 00
Average value per mile of all property		$8 405.81
Increase in taxable valuation during the year		565 562 00

TAXATION.

The limits to which taxation may go are fixed in the constitution and are as follows:

One per centum per annum of the assessed valuation for state taxes.

One-half of one per centum for county purposes, with an additional one-half per centum to pay indebtedness existing at the time of adopting the constitution.

One-half of one per centum for municipal purposes in cities and towns, with an additional one-half per centum to pay indebtedness existing in 1874.

The state has not levied its limit for many years, the usual levy being about one-half the limit, or five mills on the dollar. Counties that have paid their old indebtedness usually levy five mills. The average rate of taxation for all purposes throughout the state is about fourteen mills on the dollar per annum.

EDUCATION.

The constitution of 1874, the present organic law, made public education by taxation perpetual. Along with the growth of population and wealth has gone a greater development of educational facilities. The system has demonstrated its value to the state and is to-day more firmly imbedded in the affections of a greater number of citizens than any other part of the state's polity. The schools are in every locality open alike to the rich and poor. Although taught in separate schools, the black child has an equal showing with the white one.

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The enumeration in 1892 was 422,252, between the ages of six and twenty-one. The white enumeration was 307,781; colored, 114,471. The actual enrollment was 251,452, of which the whites furnished 187,261 and the blacks 64,191. These ratios of white to black are almost the same as the ratio of white to the black population.

The average attendance for 1892 was 140,445.

The percentage of average attendance upon enrollment was .56 per centum, something more than the same percentage for the same time in New York.

In percentage of enrollment to population, Arkansas in 1890 excelled New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia, South Carolina, Georgia, North Dakota, Louisiana, Montana, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Idaho, Alaska, Oregon and California. The only New England state that outranked Arkansas was Maine. The per cent. of colored enrollment to population (19.11) was greater than that of any New England or middle state except Maine as to its whole enrollment.

SUMMARY OF ENUMERATION OF THE SCHOLASTIC POPULATION OF ARKANSAS FROM 1869 TO DATE.

1869-'70	176,910	1881-'82	272,841
1870-'71	180,274	1882-'83	289,617
1871-'72	196,237	1883-'84	304,962
1872-'73	194,314	1884-'85	323,943
1873-'74	148,128	1885-'86	338,506
1874-'75	168,929	1886-'87	358,006
1875-'76	168,929	1887-'88	377,736
1876-'77	189,130	1888-'89	388,129
1877-'78	203,567	1889-'90	404,379
1878-'79	216,475	1890-'91	405,587
1879-'80	236,600	1891-'92	418,566
1880-'81	247,457	1892-'93	422,252

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TABLE SHOWING ENUMERATION BY RACES FROM 1883 TO DATE.

1883-'84	White	227,533	1888-'89	White	288,381
1883-'84	Colored	76,429	1888-'89	Colored	99,748
1884-'85	White	247,178	1889-'90	White	297,665
1884-'85	Colored	76,770	1889-'90	Colored	106,714
1885-'86	White	252,290	1890-'91	White	297,904
1885-'86	Colored	86,216	1890-'91	Colored	107,683
1886-'87	White	266,188	1891-'92	White	306,309
1886-'87	Colored	91,818	1891-'92	Colored	112,176
1887-'88	White	279,224	1892-'93	White	307,781
1887-'88	Colored	98,512	1892-'93	Colored	114,471

SUMMARY OF ENROLLMENT IN THE SCHOOLS OF ARKANSAS, FROM JUNE, 1869, TO DATE.

1868-'69	67,412	1880-'81	98,744
1869-'70	107,908	1881-'82	117,696
1870-'71	69,927	1882-'83	112,223
1871-'72	32,863	1883-'84	153,216
1872-'73	59,587	1884-'85	164,757
1873-'74 (no report)		1885-'86	175,935
1874-'75 (no report)		1886-'87	183,095
1875-'76	15,890	1887-'88	202,754
1876-'77	33,370	1888-'89	216,152
1877-'78	33,740	1889-'90	205,262
1878-'79	55,049	1890-'91	242,117
1879-'80	70,973	1891-'92	251,452

TABLE SHOWING ENROLLMENT BY RACES, FROM 1883 TO DATE.

1882-'83	White	84,101	1887-'88	White	152,184
1882-'83	Colored	28,132	1887-'88	Colored	50,570
1883-'84	White	115,648	1888-'89	White	159,770
1883-'84	Colored	37,568	1888-'89	Colored	56,382
1884-'85	White	122,296	1889-'90	White	154,259
1884-'85	Colored	42,461	1889-'90	Colored	51,003
1885-'86	White	129,137	1890-'91	White	178,289
1885-'86	Colored	46,798	1890-'91	Colored	73,380
1886-'87	White	134,643	1891-'92	White	187,261
1886-'87	Colored	84,452	1891-'92	Colored	64,191

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THE PUBLIC SCHOOL STUDIES.

1891.

Number studying orthography	188,552
Number studying reading	168,514
Number studying mental arithmetic	70,103
Number studying written arithmetic	84,469
Number studying English grammar	43,387
Number studying geography	52,985
Number studying history	24,973
Number studying higher branches	3,610
Number studying penmanship	97,547

1892.

Number studying orthography	203,037
Number studying reading	187,271
Number studying mental arithmetic	80,778
Number studying written arithmetic	97,098
Number studying English grammar	53,726
Number studying geography	63,693
Number studying history	30,784
Number studying higher branches	4,545
Number studying penmanship	104,792

TEACHERS AND THEIR SALARIES.

Teachers—1892.

Number white male teachers employed	3,110
Number white female teachers employed	1,358
Total white teachers employed	4,468
Number colored male teachers employed	880
Number colored female teachers employed	293
Total colored teachers employed	1,173
Total teachers employed	5,641

Salaries—1892.

Average salary for first grade, male	$43 81
Average salary for first grade, female	37 25

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Average salary, second grade, male	34 76
Average salary, second grade, female	32 50
Average salary, third grade, male	30 24
Average salary, third grade, female	29 00

The month represents twenty days. These tables show a gradual increase in the wages of every grade of teachers of each sex. The increase of wage earning is almost in direct ratio with teacher improvement.

Every item indicates a vigor almost unparalleled.

From the figures adduced it follows that—

Average wages of all teachers in 1891 was	$33 65
Average wages of all teachers in 1892 was	34 59
Increase	94
Average wages of males, 1891	35 12
Average wages of males, 1892	36 27
Increase	1 15
Average wages of females, 1891	32 18
Average wages of females, 1892	32 80

From which it appears that the average wages of males exceeds that of the females by only $2.94, if 1891 be taken as a basis; and by $3.47 if 1892 be taken.

The average monthly wages in the towns of New York for 1891 was $33.08, or 55 cents less than the average for all classes in Arkansas.

Average female wages in Massachusetts	$44 79
Excess over Arkansas	11 99
Michigan average males (1890)	32 31
Michigan average, females	25 22
Excess in favor of Arkansas for males	2 81
Excess in favor of Arkansas for females	6 56
Tennessee average monthly wages, 1891	31 37
Arkansas, 1891	33 65
Excess in favor of Arkansas	2 28
Mississippi, 1891	27 74
Excess in favor of Arkansas	5 91

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Iowa, 1891, males	37 54
Excess against Arkansas	2 42
Iowa, 1891, females	30 52
Excess in favor of Arkansas	1 66
Ohio, 1890, elementary schools, males	37 00
Ohio, 1890, elementary schools, females	27 00
Ohio, 1890, country high schools, males	58 00
Ohio, 1890, country high schools, females	39 00

The total number of school houses owned by the state in 1892 was 2,946 with a value of $1,765,831.

SCHOOL REVENUES.

The school revenues are drawn from an annual levy of two mills on all the property of the state; a local levy of not exceeding five mills in every district, and a poll tax of one dollar.

These several taxes yielded the following amounts in 1892:

State tax	$ 321,545 39
Poll tax	154,728 40
Local tax	600,102 40
Miscellaneous	10,800 66
	$1,087,236 85

The expenditures were:

For teachers' salaries	$ 907,141
For houses	4,200
For building	104,166
For apparatus	12,505
For commissions	30,077

Excepting Mississippi, West Virginia and six other northern states, Arkansas expended in 1891 more money on public schools in proportion to the taxed wealth of the state than any other state in the Union.

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EDUCATION IN THE SOUTH.

The following exhibit shows at a glance the steady progress of the southern states in the development of common school education. There are no statistics accessible that show separate items for the white and colored schools previous to 1876. Since that period the enrollment of white pupils has increased 75 per cent, while the white population has increased a little more than 30. The colored enrollment has increased 113 per cent, while the colored population has increased less than 25 per cent. The amount of money expended from public funds has increased from $11,000,000 to $23,000,000 per annum.

Since 1888-89 there has been expended fully $100,000,000, making a grand total in seventeen years of more than $316,000,000. Of this fully 40 per cent was used for the education of colored children, a far greater sum than their relative numerical population, or their contributions in taxes. The assertion that injustice is or has been done the colored children of the south by the white citizens is not borne out by the facts.

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SIXTEEN FORMER SLAVE STATES AND THE DISTRICT OF COLUMBIA.

YEAR.	COMMON SCHOOL ENROLLMENT.		COLORED.			EX-PENDITURES.
	White.	Colored.	Normal Schools.	Other Second'y and Higher.	Total Colored.	Both Races.
1876 77	1,827,139	571,506	3,785	4,726	580,017	$ 11,231,073
1877-78	2,034,946	675,150	5,236	7,795	688,181	11,760,214
1878-79	2,013,684	685,942	6,171	8,253	700,366	12,181,602
1879-80	2,215,674	784,709	7,408	7,996	800,113	12,475,044
1880-81	2,234,871	802,374	7,621	8,372	802,372	13,359,784
1881-82	2,249,263	802,982	8,509	9,889	821,380	14,820,972
1882-83	2,370,110	817,240	8,509	9,889	835,638	14,324,925
1883-84	2,546,448	1,002,313	10,771	13,035	1,026,119	17,053,467
1884-85	2,676,911	1,030,463	8,390	15,110	1,053,963	17,227,373
1885-86	2,773,145	1,048,659	6,207	16,831	1,071,697	18,439,891
1886-87	2,975,773	1,118,556	1,771	11,577	1,131,904	20,821,999
1887 88	3,110,606	1,140,405	5,439	12,254	1,158,098	21,810,158
1888-89	3,197,830	1,213,092	7,462	18,068	1,238,622	23,226,982

Total amount expended in thirteen years, $216,644,699. (U. S. Educational Report, 1888-89.)

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HOMICIDE.

It has been charged that homicide is the natural law of the south, and especially Arkansas. The following brief selection from the census of 1890 will help dispel this illusion. The number following the name of the state indicates the ration of homicides in a state to a million of its population.

SOUTHERN STATES.		WESTERN GROUP.	
South Carolina	139	Arkansas	176
Georgia	189	Kansas	121
Florida	289	Montana	340
Kentucky	236	Colorado	184
Tennessee	168	New Mexico	358
Alabama	222	Arizona	906
Mississippi	168	Nevada	896
Louisana	293	Idaho	308
Texas	327	California	346

Now, whatever may be the degree of southern lawlessness it must be conceded that it cannot compare with the western article, and that Arkansas is a highly civilized community when compared with Montana or California. If increase of homicides is any index to the prevailing moral sentiment, then Arkansas has a better moral sentiment than Vermont. The state of Vermont pushed its ratio of homicides from 33 in 1880 to 72 in 189, or 118.18 per cent. Arkansas advanced from 133 in 1880 to 176 in 1890, or 32.33 per cent, or a difference of 85.85 per cent in favor of improvement in Arkansas. In fact, the average increase of percentage in the North Atlantic group of states was 41.38 per cent, as against an increase of 32.33 per cent in Arkansas. From this it is evident that the life of every emigrant is nearly twice as secure in Arkansas as it is in California or Montana, and about four times that of Nevada.

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TEMPERANCE.

This vexed question has for years been the burden of the best thought of the state. It is controlled legally in several ways:

1. By special enactments prohibiting the sale of intoxicants within a radius of from three to ten miles of certain churches or school houses.

2. By the majority vote of the citizens of a county.

3. By the petition of a majority of the adults in a county or town. Every woman is permitted to sign the petition and has an equal voice in the final decision in this matter.

The combined action of these three laws has almost banished the saloon from the state. Whole counties are absolutely free and the moral sentiment of the state is decidely opposed to intemperance and to the open saloon. The officers of the state, counties and towns are as a rule sober men. No state in the Union can show a better temperance record, whether in law or private life, than Arkansas has shown during the last twenty years. From Little Rock to Van Buren, one hundred and sixty miles, there is but one open saloon. Twenty-two counties exclude the sale of intoxicants entirely while the greater part of every county is under some form of prohibition enactment.

INCORPORATED COMPANIES.

Since January 1, 1889, there have been four hundred and twenty manufacturing associations formed with capital stocks ranging from five thousand dollars, the least, to one million dollars, the greatest. The usual capital stock being fifty thousand dollars.

BANKS.

Since January 1, 1889, fifty-four banks have been incorporated with paid up capital stock amounting to more than three millions of dollars. These institutions added to the older banks give ample protection to depositors and furnish the means for a great commercial activity.

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BUILDING AND LOAN ASSOCIATIONS.

Besides the regular banks there have been established since January 1, 1889, about forty-five building and loan companies with a capital of more than twenty millions of dollars. This vast amount is virtually invested in thousands of modern homes abounding in joy and numberless comforts.

The following statement from the last report of Hon. C. B. Myers, land commissioner of Arkansas, will show the quantity of land now belonging to the state:

CLASS—FORFEITED LANDS.	ACRES.
Quality passed through overdue tax suits under acts of 1881, now subject to taxation or sale at $1.25 per acre	290,160.00
Quality subject to donation or sale at $1.25 per acre, upon which no suit was ever brought under the overdue tax acts of 1881	681,800.00
Vacant swamp lands	53,`70.05
Internal improvement lands	26,293.41
Seminary lands	514.36
Saline lands	11,415.71
Real estate bank lands	5,988.12
Total number of acres	1,070,041.65

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CEREALS.

The following figures from the census of 1890 show the production of the cereals in Arkansas as compared with several other states:

AVERAGE YIELD PER ACRE.

STATES.	Indian Corn.	Oats.	Rye.	Wheat.
Arkansas	20.61	14.50	6.15	6.80
Wyoming	12.73	27.39	.....	.....
Montana	13.96	29.10	.....	.....
Idaho	18.13	26.70	.....	.....
Utah	14.66	26.29	.....	.....
Colorado	12.67	28.59	.....	.....
New Mexico	20.45	22.13	.....	.....
Arizona	19.06	23.10	.....	.....
Georgia	11.33	9.22	4.15	5.58
Alabama	14.14	9.37	6.67	5.26
Florida	9.77	9.32	15.70	9.06
Delaware	17.72	19.76	8.55	15.91
North Dakota	15.35	14.32	7.78	9.74
South Dakota	17.46	12.87	7.06	7.32
North Carolina	10.92	8.33	4.90	6.44
South Carolina	10.23	9.80	4.19	3.70
Virginia	16.98	11.49	7.63	10.72
Oregon	19.68	27.20	9.23	16.81
Washington	16.33	34.92	10.88	17.03

ACTUAL YIELD IN 1889.

CEREALS.	Acres.	Bushels.
Indian corn	1,648,443	33,982,318
Oats	288,332	4,180,877
Rye	2,470	15,181
Wheat	140,464	955,668
Barley	106	904
Buckwheat	388	5,074

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ACTUAL YIELD OF CORN IN SEVERAL STATES IN 1889.

STATES.	BUSHELS.	STATES.	BUSHELS.
Arkansas	33,982,318	California	2,381,270
Virginia	27,154,633	Michigan	28,785,579
Georgia	29,261,422	Colorado	1,511,907
South Carolina	13,770,417	New Mexico	583,489
Alabama	30,073,036	Minnesota	24,696,446
North Carolina	25,783,620	Arizona	82,535
Florida	3,701,264	North Dakota	183,929
West Virginia	13,730,506	Oregon	238,203
Maine	380,662	Washington	156,413
Delaware	,097,164	Wyoming	25,162
New Hampshire	988,806	Montana	14,225
Vermont	1,700,688	Idaho	24,095
Rhode Island	253,810	Utah	84,760
Massachusetts	1,330,101	Nevada	6,540
Connecticut	1,471,979		

It will be seen that Arkansas leads all that are named.

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SUMMARY OF CEREAL PRODUCTION OF ARKANSAS IN 1889.

COUNTIES.	INDIAN CORN.		OATS.		WHEAT.	
	Acres.	Bushels.	Acres.	Bushels.	Acres.	Bushels.
Total	1,648,443	33,982,318	288,332	4.180,877	140,464	955,668
Arkansas	14,458	259,898	1,392	29,259	59	733
Ashley	17,759	333,170	930	8,336	2	15
Baxter	14,421	336,565	5,324	101,174	4,171	27,026
Benton	59,337	1 340,629	23.490	451,726	21,106	162,639
Boone	34,294	884,100	9,609	192.210	10,146	64,629
Bradley	12,653	182,992	1,506	13,706	18	80
Calhoun	13,125	167.186	1.352	10,390	.....	.....
Carroll	33,369	844,743	9,759	188,345	7.528	48,767
Chicot	6,166	117,943	153	1,577	.....	.....
Clark	29,121	477,226	2,715	35,621	110	555
Clay	22,174	484,540	1,249	21.098	1,734	14,028
Cleburne	14,339	290,112	3,730	45.250	373	1,670
Cleveland	16.346	238,200	1,910	19,036	4	50
Columbia	35.074	419,905	2,244	16,812	10	250
Conway	24 038	496,401	3,649	45,893	1,160	5,443
Craighead	19.143	442,723	2,609	28,064	480	3,264
Crawford	29 500	709,182	5,563	78,088	1,142	5,941
Crittenden	8,864	209 412	23	290	.....	.....
Cross	7,528	147,674	314	4,133	12	80
Dallas	13,451	183,256	1,721	13.346	18	146
Desha	8,325	194,646	89	524	.....	.....
Drew	20 799	344,355	2,790	29,740	65	283
Faulkner	29,387	556,324	5,502	69,808	933	5,054
Franklin	35,253	744,816	10,228	137,094	2,629	12,040
Fulton	17,651	480,907	6,751	105,794	3,011	17,172
Garland	11,811	206,549	2,232	32.119	561	2,448
Grant	15,197	216,444	2,081	15,499	.....	.....
Greene	22,955	455,667	2,161	29 699	1,314	9,550
Hempstead	34,344	541,831	3,978	46,429	291	1,698
Hot Spring	16,814	329,408	2,294	27,608	157	1,278
Howard	24,166	413,203	3,142	31,889	817	3,725
Independence	36,199	891.044	6,907	77,618	2.307	12,137
Izard	23,207	597,897	8,129	102,996	2,703	13,256

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SUMMARY OF CEREAL PRODUCTION OF ARKANSAS IN 1889—*Continued.*

COUNTIES.	INDIAN CORN.		OATS.		WHEAT.	
	Acres.	Bushels.	Acres.	Bushels.	Acres.	Bushels.
Jackson	23,681	568,131	734	13,447	92	1,067
Jefferson	20,728	467,388	580	5,256	.....	.....
Johnson	27,925	651,004	7,197	102,953	1,538	9,337
Lafayette	10,123	155,067	380	4,703	2	30
Lawrence	21,612	536,374	3,510	44,003	1,053	7 461
Lee	16 181	357,612	398	8.460	.....	.....
Lincoln	8,105	152,658	150	1,918	.....	.....
Little River	13,835	243,806	866	12,363	23	424
Logan	35,915	828,359	11,283	157,599	3,512	17,932
Lonoke	24,428	501,274	3,907	54,735	28	198
Madison	39,354	941,099	8,142	120,224	9,553	69.124
Marion	19,518	433,250	3,495	60 980	4,649	26,811
Miller	17,937	290,389	1.397	13,179	.....	.....
Mississippi	12,534	464,671	114	2.950	.....	.....
Monroe	18,441	364,669	458	9,163	63	681
Montgomery	15,606	315,671	2,056	26,236	1,386	7,604
Nevada	28,246	381,503	3,444	37,916	58	371
Newton	18,199	381,419	2,535	38,657	3,214	20.484
Ouachita	24,152	288,720	1,114	9 654	.....	.....
Perry	9,175	210,555	1,502	24.214	432	2,435
Phillips	22.961	488,152	282	2,570	.....	.....
Pike	17,007	304,381	2,647	29,712	421	1,723
Poinsett	6,191	148,199	333	6,323	.....	.....
Polk	19,715	365,783	3,636	42,922	2,401	11,668
Pope	32,360	718,157	5,544	64,190	2,852	15,805
Prairie	14,984	296,446	2,061	33,917	207	2,676
Pulaski	20,326	454,559	2,942	41,818	39	700
Randolph	33,048	773,996	7,137	104.294	3,540	22,269
St. Francis	11,048	207,466	570	9,547	.....	.....
Saline	17,527	324,244	2,753	31,386	140	855
Scott	22,576	477,690	6,520	83,390	1,203	8,348
Searcy	18.230	419,800	8 412	52,152	3,937	24,947
Sebastian	34,287	793.298	10,644	154,842	2,040	11,411
Sevier	18,416	328.621	1,184	10,780	538	2,537
Sharp	22,527	479,268	7,122	86,645	2,486	12.385
Stone	12,344	312,516	2,605	46,402	1,524	8,782

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SUMMARY OF CEREAL PRODUCTION OF ARKANSAS IN 1889—*Continued.*

COUNTIES.	INDIAN CORN.		OATS.		WHEAT	
	Acres.	Bushels.	Acres.	Bushels.	Acres.	Bushels.
Union	30,437	350,227	2,042	13,166	44	269
Van Buren	18,616	350,801	4,452	50,273	1,212	5,6.8
Washington	70,828	1,832,189	21,460	403,678	26,511	236,659
White	34,171	613,868	6,868	80,295	190	846
Woodruff	14,890	373,978	133	2,514	10	33
Yell	29,045	641,430	5,448	67,305	2,675	12,871

In Arkansas the total area in cereals in 1889 was 2,080,203 acres, as compared with 1,672,446 acres in 1879. There was an increase of 350,133 acres in the area devoted to corn, and 121,819 acres in the area in oats. On the other hand, there was a decrease of 63,620 acres in the area devoted to wheat.

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COTTON.

SUMMARY OF BALES COTTON RAISED IN ARKANSAS IN 1879 AND 1889.

COUNTIES.	1889.		1879.	
	Acres.	Bales.	Acres.	Bales.
Total	1,700,612	691,423	1,012,976	608,256
Arkansas	13,718	7,197	12,611	8,508
Ashley	30,633	17,246	19,555	11,371
Baxter	8,495	3,467	4,798	2,879
Benton	28	10	286	126
Boone	7,461	2,377	5,095	2,686
Bradley	14,970	6,218	12,221	4,900
Calhoun	15,564	5,273	13,377	5,370
Carroll	1,230	289	982	502
Chicot	33,624	21,480	26,941	25,338
Clark	28,566	11,190	25,092	13,924
Clay	7,392	2,059	4,239	2,307
Cleburne	7,800	2,275	.....	.....
Cleveland(*)	22,376	9,018	15,462	6,146
Columbia	45,733	13,352	32,42;	13,039
Conway	37,149	12,062	15,424	9,096
Craighead	10,686	3,838	7,246	4,374
Crawford	35,069	13,375	16,145	8,980
Crittenden	44,309	19,186	24,413	16,039
Cross	11,262	4,656	7,607	4,768
Dallas	15,039	5,791	14,306	6,157
Desha	26,941	16,641	21,159	18,103
Drew	38,398	17,609	21,796	9,964
Faulkner	34,381	12,141	15,749	8,692
Franklin	32,342	10,954	16,205	9,268
Fulton	9,116	2,484	3,994	2,438
Garland	2,725	1,011	993	534
Grant	13,956	5,335	9,680	3,999
Greene	9,330	2,421	6,886	3,711
Hempstead	44,068	15,985	27,142	13,985
Hot Spring	10,667	4,092	8,068	3,755
Howard	22,952	8,521	12,259	7,051
Independence	30,230	9,651	19,602	11,156

*Dorsey County 1879.

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SUMMARY OF BALES OF COTTON RAISED IN ARKANSAS, ETC.—*Continued.*

COUNTIES.	1889.		1879.	
	Acres.	Bales.	Acres.	Bales.
Izard	15,069	4,235	9,029	4,800
Jackson	33,446	12,594	21,718	13,895
Jefferson	90,996	47,341	45,426	34,588
Johnson	21,750	7,667	12,217	7,769
Lafayette	15,193	5,767	10,611	6,339
Lawrence	15,191	4,727	10,768	6,480
Lee	65,864	25,278	33,009	21,147
Lincoln	18,330	9,112	17,519	11,563
Little River	16,733	7,252	10,368	7,116
Logan	36,431	14,476	16,377	9,752
Lonoke	38,651	18,972	20,910	11,704
Madison	20	18	255	129
Marion	8,211	2,780	7,116	3,25
Miller	23,623	8,970	19,111	11,43
Mississippi	31,734	14,648	13,326	10, 30
Monroe	34,144	18,989	22,017	14, 06
Montgomery	7,316	2,397	3,512	1,819
Nevada	31,598	10,588	23,925	10,520
Newton	4,289	1,480	2,602	1,406
Ouachita	30,757	10,541	23,855	8,849
Perry	11,219	4,252	5,082	3,314
Phillips	64,142	29,923	42,654	29,070
Pike	13,531	4,831	7,341	3,787
Poinsett	3,534	1,592	2,373	1,514
Polk	9,662	2,831	4,230	2,061
Pope	31,288	11,272	15,062	8,700
Prairie	20,802	9,587	12,124	6,977
Pulaski	40,564	21,485	29,097	20,439
Randolph	18,194	4,905	11,028	6,248
St Francis	26,828	11,602	11,857	5,966
Saine	13,263	5,774	8,846	5,075
Scott	15,521	6,415	8,867	4,826
Searcy	6,689	2,405	4,320	2,464
Sebastian	30,217	11,778	19,722	11,112
Sevier	15,801	5,635	7,283	4,075
Sharp	14,138	3,643	8,455	4,350

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SUMMARY OF BALES OF COTTON RAISED IN ARKANSAS, ETC.—*Continued*

COUNTIES.	1889.		1879.	
	Acres.	Bales.	Acres.	Bales.
Stone	5,808	1,858	3,656	2,049
Union	40,272	12,063	30,136	11,013
Van Buren	10,630	3,156	7,084	3,377
Washington	509	140	302	133
White	33,806	11,514	23,304	11,821
Woodruff	38,834	17,453	18,124	12,311
Yell	29,830	12,273	16,598	10,428

SUMMARY OF BALES OF COTTON RAISED BY STATES.

STATES.	Acres.	Bales.
North Carolina	1,747,206	336,245
South Carolina	1,987,651	746,798
Georgia	3,345,526	1,191,919
Florida	227,370	57,928
Tennessee	745,176	189,072
Alabama	2,761,771	915,414
Mississippi	2,882,499	1,154,406
Louisiana	1,270,885	659,583
Arkansas	1,700,612	691,423
Texas	3,932,755	1,470,353

From these figures it appears that Arkansas stands second in actual yield per acre, the percentages of yield being:

STATES.	Bales.
North Carolina	20
South Carolina	37
Georgia	35
Florida	24
Tennessee	25
Alabama	32
Kentucky	33
Mississippi	40
Louisiana	52
Arkansas	41
Texas	37
Missouri	26
Virginia	14

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FLAX.

The following table shows rank of the State in several important details as to the flax industry:

	Rank.
Acreage	27
Production of seed	28
Production of fibre	21
Total value of products	28
Average yield of seed per acre	20
Average value of products per acre	22

The industry is carried on to a limited extent in Desha, Madison and Prairie Counties.

HORSES, MULES AND ASSES.

Horses on hand 1890	186,867
Mules	124,888
Asses	1,600

Twenty-eight states and territories produced a smaller number of horses, and forty-one a smaller number of mules. The states which outrank Arkansas in production of mules are Georgia, Missouri, Kentucky, Tennessee, Alabama, Mississippi and Texas.

TOBACCO.

There were 5,448 planters of tobacco in 1890 with an area of 1875 acres in cultivation. The crop yielded 954,640 pounds valued at $86,862. Average yield per acre 509 pounds. The state ranks 16 in acreage and production, 21 as to average yield per acre, 17 as to value of product, 18 as to average value per pound and 8 as to number of planters. Every county in the state except Lee was reported in 1890 as cultivating tobacco.

NURSERIES.

In 1890 there were 68 nurseries, using 767 acres of land at a value of $38.90 per acre, or a total value of $80,410.

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The total capital invested that year was $119,800; 421 acres were devoted to the growth of trees; 84 to apple, 21 to cherry, 22 to peach, 35 to pear, 32 to plum, 5 to other trees; 34 to grape vines, 128 to strawberries, 19 to raspberries, 13 to blackberries and 28 to miscellaneous plants; 11,900 one year apple trees were grown to the acre, which sold at the average wholesale price of $5.22 per 100.

12,000 apricots trees per acre at	$ 7 00 per 100
10,000 cherry trees per acre at	8 00 per 100
13,000 peach trees per acre at	5 37 per 100
10,000 pear trees per acre at	13 50 per 100
10,600 plum trees per acre at	11 32 per 100
11,000 quince trees per acre at	8 00 per 100
15,571 grape vines per acre at	4 07 per 100
44,000 strawberries per acre at	28 per 100
20,000 raspberries per acre at	60 per 100
20,000 blackberries per acre at	85 per 100

FLORISTS.

Arkansas has ten establishments of this kind, cultivating twenty acres with a value of $30,800. In 1890 these establishments propogated 26,750 roses and 25,000 hardy plants. All other plants aggregated 213,750. The total plant sale reached $21,250, and the cut flowers sold for $2,875.

The figures for the full cash value per acre on all crops taken together are not yet collected, but the following taken from the first bulletin of the Arkansas Bureau as gathered from the census of 1880 has not lost any of its force, and will doubtlessly be strengthened by the decade just past:

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Maine	$13 51	Georgia	$10 35
New Hampshire	13 60	Florida	8 52
Vermont	11 82	Alabama	13 49
Connecticut	16 15	Mississippi	14 76
New York	14 05	Louisana	22 40
New Jersey	18 68	ARKANSAS	20 40
Pennsylvania	17 80	Tennessee	12 39
Delaware	15 02	West Virginia	12 74
Maryland	17 91	Kentucky	13 58
Virginia	10 79	Ohio	15 58
North Carolina	10 09	Michigan	18 96
South Carolina	10 56	Indiana	14 66
Illinois	12 47	Nebraska	8 60
Wisconsin	13 80	California	17 18
Minnesota	10 29	Oregon	17 11
Iowa	8 88	Texas	14 69
Missouri	10 78	Nevada, Colorado and Territories	16 13
Kansas	9 11		

MINERAL WATERS.

There are hundreds of mineral springs in Arkansas aside from the great resorts at Hot Spring's Eureka Springs and Mammoth Springs. Only three report the preparation of waters for commercial purposes. The product bottled in 1889 reached 110,200 gallons and yielded a value of $10,020. The capital invested in the business amounted to $12,525, and paid a wage sum of $3,690. The greater value of these springs as health resorts, scattered as they are over more than twenty counties, makes the lesser work of bottling their waters for sale a comparatively small amount. The annual expenditures of money by the visitors at Hot Springs reaches the enormous sum of $10,000,000. The three reporting springs are the Arkansas Lithia Springs of Hope, Fairchild Potash Sulphur Springs at Potash Sulphur, and the Mountain Valley Springs at Mountain Valley. Other springs are commercially engaged but no report has been made. A true report would place the state among the leaders of those who prepare mineral waters for sale.

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For great spring resorts and visitors no state in the Union surpasses Arkansas.

LIMESTONE.

The industry has hardly opened. The value of the product in 1889 was $18,360; the capital employed $32,531. The per cent of profit on the capital employed was 12.05 per cent, and on the value of the product 21.35 per cent. The per centum of wages to expenses was 68.21, and to total value 53.61. With a greater transportation this will become a great source of wealth. Seven quarries produced 18,700 cubic feet for building purposes, valued at $18,360, and 37,600 barrels of lime valued at $14,600.

GRANITE.

The immense beds of this stone are now attracting general attention. Whether as paving stone, or as building material, the Arkansas granite is unsurpassed. The splendid court house at Little Rock is a monument to this beautiful stone. Large quantities have been used for paving purposes in Louisville, Ky., and Little Rock. Several large quarries near Little Rock are doing a handsome business. The census of 1890 says: "Arkansas, though holding next to the last place in the lists of states for 1889, will doubtless show a much greater output in the course of a few years owing to developments already made in the vicinity of Little Rock of what is known as Fourche Mountain granite, which is, strictly speaking, syenite."

USES OF BLUE GRANITE.

The blue granite (pulaskite) has already been quarried to a considerable extent both as a building stone and as a material for roads, either in the form of Belgian blocks for streets or of crushed stone for macadamized highways. As a building stone it has been used very largely in the form of window and door-sills. window caps, water tables, stone steps, and foundation materials, and has also been used as the principal wall stone in several large edifices.

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The Pulaski county court house on the corner of Second and Spring streets, Little Rock, is built above the basement of blue granite (pulaskite) trimmed with limestone. The basement is constructed of the brown granite (dike rock). This building is tasteful and the contrast between the different stones used in its construction is very pleasing.

The Roman Catholic cathedral on the corner of Seventh and Louisana streets, Little Rock, is built partly of the blue and partly of the brown granite, but the two stones are mingled in such a way, as to give a somewhat mottled appearance to the building. It is, therefore, not as handsome a building as would have been produced had either rock been used alone.

The Dallas county court house in Dallas, Texas, is built in part of the blue granite of Arkansas and is already so far completed as to show that it will be an extremely handsome building. Several other buildings in Dallas are built in part of the Arkansas stone.

The First Methodist church of Memphis, Tennessee, is built mostly of the blue granite, and this material has been extensively used in the construction of a large brewery in the same city.

The stone appears in many store fronts, retaining walls, bridge piers and abutments throughout the state, and has also been much used for such minor purposes as hitching and gateposts and mounting blocks.

Thousands of tons of this rock has been quarried for Belgian blocks, and have been shipped to many of the neighboring cities, as Louisville, Memphis, etc., as well as having been used in Little Rock itself. No better stone can be conceived of for this purpose, for it fulfills all the requirements, that are made of such material. It is strong enough to withstand any blows it may receive and at the same time is hard enough to resist the wear to which it may subjected, better than any known granite or syenite. It does not become

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smooth and slippery under continual wear as paving blocks consisting of only one mineral or very fine grained constituents are known to do.

BAUXITE.

This important mineral, or ore, is found in Arkansas in the neighborhood of the granites, and in the tertiary areas. It has been found in Saline and Pulaski counties, and covers a known area of 640 acres.

The following is a copy of the special report of State Geologist Branner to the governor, and one of the most important ever made:

THE REPORT.

GEOLOGICAL SURVEY OF ARKANSAS
LITTLE ROCK, ARK., Jan. 7, 1891.

To His Excellency, J. P. Eagle, Governor:

SIR—The field work of the geological survey having been suspended, the facts given below, which appear to be of more than usual importance, are made known without waiting for the complete report, in which they will be treated in details This brief preliminary statement refers only o the survey work upon kaolin and kindred deposits. Most of it relates to the bauxite deposits, but inasmuch as frequent inquiries are made for kaolin, and as the survey does not feel at liberty to give information regarding any of these matters prior to its publication, a word of general information is added regarding our kaolin beds.

BAUXITE DEPOSITS.

It is found that we have in Arkansas, in Saline and Pulaski counties, a mineral that is used in the manufacture of aluminum, a metal of great and rapidly increasing importance, as well as for other useful purposes. This is the mineral bauxite (bozite), sometimes called "honey-comb rock," through the region in which it occurs in this state.

Bauxite is not a common mineral in any part of the world,

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and as it has a spongy earthy appearance, and is very light, there is nothing about it to attract the attention, and this is probably the reason it has been so long overlooked. In order that there may be no mistake about its identity, samples of the common varieties have been deposited with the commissioner of agriculture in the state house.

In some places bauxite has been prospected upon with a view to using it as an iron ore; in others, so little has been thought of it that it has been quarried and used for building roads. In most cases the exact thickness of the deposits has not been determined, but in general, it varies from a few feet to over forty feet in thickness; it is thought safe to place its average thickness at about fifteen feet. Like all bauxite, it varies considerably in composition, and in a general way, its value depends upon its having a high percentage of alumina, and low percentage of iron and silica. A few of the analyses made by the survey are therefore given. In order that some opinion may be formed of its value, I give briefly the most important uses to which bauxite is or may be put. Bauxite is available for the following purposes:

1. The manufacture of aluminum.

2. The manufacture of the highest grades of refractory materials, and for increasing the refractoriness of fire clays.

3. The manufacture of the highest grades of alum and aluminate of soda used in dyeing and calico printing.

The studies made by the geological survey of the occurrence of this mineral in Arkansas and in other parts of the world lead to the following general conclusions, which may be of value in judging of the importance of these discoveries, and in seeking deposits other than those mentioned in the list below:

I. Bauxite occurs in Arkansas only in tertiary areas and in the neighborhood of eruptive rocks (granite).

II. Inasmuch as sedimentary beds overlie or have overlain the bauxite, it is probable that there are deposits in the

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vicinity of our eruptive rocks not yet uncovered by the natural process of erosion.

III. It occurs in irregular deposits whose thickness and extent are determinable only by direct methods of examination.

IV. In the Little Rock region it has thus far been found only at and below the elevation of 300 feet above tide level.

V. The Arkansas bauxite beds are known to cover a total area of about 640 acres in Saline and Pulaski counties.

VI. All bauxites vary considerable in color, character, composition and value.

VII. Although some varieties contain a high percentage of iron, none of them have any value as iron ores. (This is the pisolitic iron ore).

VIII. With the exception of a single bed in Georgia, the Arkansas deposits of bauxites are the only ones thus far discovered in the United States, and such deposits are nowhere abundant, so far as is now known.

Below is a list of the lands upon which bauxite has been found by the geological survey. This list does not purport to be complete, for there are doubtless deposits in Saline and Pulaski counties other than those mentioned. The survey has had so much work to do that it has not been possible to locate all the occurrences.

THE LITTLE ROCK REGION.

In Township 1 North, Range 12 West.

Section 24. It occurs in the northeast quarter, at the middle of the south side of this section. The bed is cut by the Little Rock Sweet Home turnpike near the south base of Fourche mountain and the bauxite has been used in building the pike. The following is an analysis of a sample from this locality:

Silica ..... 10.13 per cent.

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Alumina ..... 55.59 per cent.
Iron (ferric) oxide ..... 6.08 per cent.
Water ..... 28 99 per cent.

In this same section it covers a large part of the southeast half of the forty acre tract upon which Hon. C. C. Bliss' house stands.

Section 25. It is exposed in the middle of the west side of the northeast quarter, in the edge of the field west of the Confederate home. From this point the deposit seems to extend southwest by west, along the foot of the granite ridge.

A well dug on lot 11 in the village of Ridgewood passed through seven feet of bauxite.

It occurs also at the southwest corner of section 25. It occurs again an eighth of a mile due south of the center of section 25, near the road and in the field to the northwest of this point. Due southwest from the center of section 25, and less than a quarter of a mile away, it outcrops in the top of a hill, and is exposed at several places around its summit.

Section 26. At the middle of the north side of this section, principally in the northeast of the northwest, and also extending into the section just north of it there is another deposit.

Section 36. On the northwest corner of this section bauxite is exposed about the brow of the hill west of Mr. Tarplay's.

An average sample from this locality gave the following analysis:

Silica ..... 11.48 per cent.
Alumina ..... 37.62 per cent.
Iron (ferric) oxide ..... 1.83 per cent.
Water ..... 28.63 per cent.

In Township 1 South, Range 12 West.

There are two exposures on the southwest of the south-

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west of section 4, near the turnpike. One of them is on the summit of the little hill 100 feet west of the pike, just half a mile north of its southern end; the other is about 600 feet south of the first, on the west side of the road, and less than thirty feet from it. In section 5, near the center of the southeast quarter of the southwest quarter, it is exposed. Again on the south half of the southeast quarter of section 5 on the hill east of Littlejohn's.

Four exposures are known on section 9, as follows: First, at the center of the west side of the northeast quarter, just north of where the "middle Pine Bluff road" joins the turnpike. The beds here are over twenty feet thick. Second, about fifty feet west of the junction of the pike with the Pine Bluff road. Third, west of the Pine Bluff road on the southeast of the southwest. Fourth, west of the Pine Bluff road in the northeast of the southwest.

THE MABELVALE REGION.

The deposits known as the Mabelvale region are all in township 1 south, range 13 west, as follows:

On section 2, in the southwest of the southeast. This is near the line between sections 2 and 11.

On section 10, east of the house of J. W. Hopkins, on the east half of the northwest quarter, and also on the northeast of the northeast quarter. The road running east, southeast from Mabelvale, passes over the latter deposits about half a mile from the railway station.

On section 11 the deposit mentioned as occurring on section 3 seems to extend into section 11 for a short distance.

On section 12 it occurs on the southeast quarter of the northwest quarter.

THE SALINE COUNTY REGION.

The exposures in the Saline county area are all, so far as they are now known, in township 2 south of range 14 west, as follows:

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On section 1 a very ferruginous variety occurs on the northwest quarter. This deposit lies along the line between sections 1 and 2, and it may extend into the latter section.

On section 2 about half a mile north of where the Camden and Little Rock road crosses Hurricane creek is a ferruginous deposit of bauxite. There is some doubt about the exact location of this bed.

On section 3 it occurs on the southeast of the southwest, where it has been opened up for iron ore. Two samples from this locality have the following composition.

BLACK VARIETY.

Silica	5.11 per cent.
Alumina	55.86 per cent.
Iron (ferric) oxide	19.45 per cent.
Water	17.39 per cent.

RED VARIETY.

Silica	4.89 per cent.
Alumina	46.44 per cent.
Iron (ferric) oxide	22.15 per cent.
Water	26.68 per cent.

On sections 9 and 10 the deposits are red, brown and cream colored. They lie on the southwest of the southwest of 10 and extend into the southeast corner of 9. It has been opened up for iron. A sample of the red variety from section 9 was analyzed with the following result.

Silica	3.34 per cent.
Alumina	58.60 per cent.
Iron (ferric) oxide	9.11 per cent.
Water	28.63 per cent.

On section 14 it is exposed on the northeast quarter and it appears to form a continuous deposit running toward the southwest, and ending near the center of the section. It seems to have been struck also in digging a well on the northwest of the southwest of this section.

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On section 15 the beds of section 10 seem to extend into the northwest quarter of section 15. See description of section 10.

On section 16 it covers a large part of the eastern half of this section, being in places, more than thirty feet thick.

On section 22 it occurs in the northwest of the southeast. On section 23 it extends through the northern tier of forties, from near the middle of the northeast of the northeast to a little west of the northeast of the northwest. It occurs also on the southwest quarter of this section.

On section 25 it is found on the northeast of the northwest, a quarter of a mile south of J. Childress' house.

KAOLIN DEPOSITS.

Kaolin is known to occur in Pike, Pulaski, Saline and Ouachita counties. The Pike county beds are on Vaughan's Creek, in township 8 south, range 24 west, section 19. So far as these beds have been prospected they are too thin (two feet) and too much stained with iron to have any value, but their geological and topographic position leads to the belief that they may be found thicker and under a protective covering that will render them valuable. The samples exhibited in the agricultural department and labeled "Pulaski County" are from Pike county. Kaolin of this particular kind is not known in this state outside of Pike county. Analysis of Pike county kaolin:

Silica	48.87 per cent.
Alumina	36.54 per cent.
Iron (ferric) oxide	0.98 per cent.
Lime	0.19 per cent.
Magnesia	0.25 per cent.
Water	13.29 per cent.
	100.09 per cent.

The Pulaski county kaolin is either modified bauxite or decayed granite. The localities of the bauxites have already

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been given. Other kaolin deposits occur in several localities in the vicinity of Fourche Mountain and Saline county granites, in 1 north, 12 west, 1 south, 12 west, and 2 south, 14 west. There are several localities in section 9, 1 south, 12 west: The following is an analysis of a sample of kaolin from section 9, 1 south, 12 west:

Silica	46.27 per cent.
Alumina	38.57 per cent.
Iron (ferric) oxide	1.36 per cent.
Lime	0.34 per cent.
Magnesia	0.25 per eent.
Potash	0.23 per cent.
Soda	0.37 per cent.
Water	13.61 per cent.
	101.00 per cent.

The Ouachita county kaolin deposits form regular beds interstratified with other tertiary rocks. One important bed has been examined in township 12 south, range 18 west, section 2, which has a thickness of more than 12 feet, the entire thickness not having been seen. The outcrop of this bed is exposed at but few places, but it is probably several miles in length.

The true nature of this material would hardly be suspected from its general appearance, or from an analysis of it as it comes from the ground, for it resembles a sandy clay. If the sand be washed out and the material analyzed it is found to have the same composition as some of the best kaolins. The following is an analysis of the Ouachita county kaolin after the greater part of the sand has been removed. An analysis of a washed sample of Pennsylvania kaolin from Brandywine Summit is given for comparison:

OUACHITA COUNTY KAOLIN.		PENNSYLVANIA KAOLIN.	
Silica	48.62	Silica	47.24
Iron (ferric) oxide	1.74	Iron (ferric) oxide	1.94
Alumina	36.52	Alumina	37.27
Water	13.40	Water	13.62

I have the honor to remain, your excellency's obedient servant, JOHN C. BRANNER, State Geologist.

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WHETSTONES, OILSTONES AND SCYTHESTONES.

The source of supply of siliceous rock in the United States used for sharpening edged tools have been the same for some years. Arkansas, Indiana and New Hampshire furnish the bulk of the supply, and a small quantity is produced in Vermont. The Arkansas stone is found in the neighborhood of Hot Springs, and is supposed to have been formed by the action of hot water upon the quartz formations. It is found in two varieties, known as "Arkansas" and "Washita" stone, the grains in the former being smaller and more compact, of a uniform bluish-white color, and semi-transparent, while the Washita stone is more opaque and of a pure white color. In Indiana two varieties also occur, known commercially as "Hindostan" and "Orange" stone, the former being white in color and the latter of a buff or orange tint. The quarries are located in Orange county. The quarries in New Hampshire are located in Grafton county, and the product consists of "rift sandstone" and "chocolate" whetstone. The Vermont quarries are located in Orleans county, and the product is used exclusively for scythestones. Some "Labrador" oilstones have in the past been produced at Manlius, Onondaga county, New York, but the factory is now used for the manufacture of oilstones from Arkansas and Washita stone.

The product of the different kinds of sharpening stones in 1889 consisted of 456 tons of scythestones, 1,500 tons of rift sandstone, 30,000 pounds of orange stone, 1,036,000 pounds of Washita oilstone, 175,000 pounds of Arkansas oilstone, and 200,179 pounds of Hindostan oilstone. The production by states is shown in the following table, and for the sake of convenience of the quantity is expressed in short tons, the weight and value being given for rough stone:

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PRODUCTION OF SHARPENING STONES IN THE UNITED STATES FOR 1889 BY STATES.

STATES.	Quantity (Short tons.)	Value.
Total	2,991	$ 32,890
Arkansas	814	20,360
Indiana	212	7,670
New Hampshire	1,515	3,750
Vermont	450	1,200

OPERATING EXPENSES IN PRODUCING WHETSTONES.

STATES.	Total Expenditures.	Wages.
Total	$23,804	$ 21,911
Arkansas	11,875	11,060
Indiana	7,814	6,763
New Hampshire and Vermont	4,781	4,088

CAPITAL INVESTED.

STATES.	Total.	In land.	In buildings, machinery etc.	In tools implements, live stock, etc	In cash.
Total	$ 57,510	$ 42,500	$3,925	$ 6,885	$ 4,200
Arkansas	20,885	18,000	625	700	1,500
Indiana	9,225	4,700	700	1,025	2,000
N. Hampshire and Vermont	27,460	19,800	2,600	4,360	700

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OILSTONES.

BY J. J. SUTTON, HOT SPRINGS.

Washita oilstone and Arkansas oilstone are both found in the same vicinity in the foothills of the Ozark mountains in several counties in Arkansas, and the center of the location and best quality of both kinds is near the city of Hot Springs. The peculiar geological formation of this section is not known to exist elsewhere in the world.

These mountains are from 500 to 1,000 feet high and mostly in long and parallel narrow ranges with wide valleys between. The strata in this region are mostly vertical with some variations in the dip, and all of the rocks have been considerably broken in the folding or elevation of the mountains. The rocks in the valleys are usually shale and on the mountain summits are quartzite, a bluish gray in color, dense and vitreous, and hard sandstone, while near the base are leads of silica rocks from 200 to 400 feet wide with various grades of hardness, color, density and purity, from black and red flint to the sofest snow white and porous rock which is used for whetstones.

The whetstone grit is in narrow leads usually from four to fifteen feet wide running through a few only of these large silica formations, vertically with a variable inward dip, and it is found only in pockets in these leads where the location has been favorable to influences which have made it porous and uniform in its crystalization. There are known to be more than 500 miles of leads of hard and flinty silica rocks with numerous places where surface stones are gritty and some used locally, but the good whetstone grades of commercial value in solid ledges have been found only in two townships in Garland county, within ten miles of Hot Springs.

There are two varieties of our oilstone rocks used for whetstones and they are commercially known as Washita

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oilstone and Arkansas oilstone. The Washita is used by carpenters and all mechanics who use tools in woodwork, and the Arkansas mostly by watchmakers, dentists and surgeons. The demand is greatest for the Washita and about twenty times as much of that sold as of the Arkansas. They are alike in composition, both being nearly pure silica, crystalized in small grains in a manner that has made many cavities, but the Washita is the most porous and has the sharpest grit. The crystals are hexagonal with sharp pointed ends and so small that they are invisible to the naked eye, but can be distinctly seen in a microscope when magnified about one hundred times. They are harder than steel and that is the reason why Washita stones will quickly wear away and sharpen steel tools. These stones are called oilstones because oil must be used on them to fill the cavities and float away the steel particles that are cut from the tools. The Washita rock is about three times as hard as marble and it is cut in the same manner, with saws of band iron and wet sand.

The sharpness of the grit in any Washita oilstone depends upon the purity of its silica combined with the character of its crystalization and number of cavities. The best grades of this rock give in a chemical analysis 99 to 99 1-2 per cent of silica and the microscope reveals in them only crystals with many cavities. There are only a few quarries as good, but nearly all, even in the best leads, contain some impurities or defects. Many Washita stones that appear good contain a small percentage of alumina which remain to clog the cavities when they wear away by use. Some contain hard spots and such will soon wear uneven, others contain many grains of sand among the crystals and they soon glaze when used, while many do not have enough cavities, but are too compact and almost solid like glass. There are leads of black Washita stone and black spots which contain carbon in several quarries which are good

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otherwise, but they are always too hard and are not quarried. The best Washita stones are white but not all of the white stones are good, while some of a light rosy red color have sharp grit and are good when of even texture.

Several doubtful theories were formerly advanced by geologists on the formation of our oilstone rocks and the reason for their having very sharp grit, but to Dr. Branner and his able assistant, Mr. Leon S. Griswold, we credit the recent discovery that the cavities estimated by them at more than 8,000,000 to the cubic inch in the best quality are rhombic in form with sharp edge corners which greatly assist the crystal grains in cutting. They also advanced the theory that our silica rocks and others were originally deposited in an ocean bed; that our mountains were elevated to their present vertical position by folding, and that the cavities were made by calcites or crystals of lime which were formed in the original rock and dissolved by a long continued leaching of water percolating through them.

It is a fact well understood by many oilstone quarrymen that the good leads are not found in the valleys, nor on the mountain tops, but are always situated near the base of a mountain, and the quarries of the porous rocks are always located where the rainwater from the summit and side run across them. Every oilstone quarry has a long mountain slope back of it and drainage through the strata below, and the depth of the good rock seems to depend upon the depth of the drainage.

The foot wall to most of the leads is very hard and much fractured but in close seams so that most of the water runs over that or through it near the surface, while below several deep quarries is a strata of sand which is about fifteen inches thick, and one of blue clay two inches thick very rich in aluminum. Hundreds of Washita quarries have been opened, but most of them were not good more than ten feet deep, and less than a dozen were good down to

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twenty-five feet, while not half of that number have proven good below fifty feet.

Applying Dr. Branner's theory, I understand that the original rock was formed in level strata on a deep sea bed and when elevated into mountains by folding, the strata were changed to a vertical position and much broken; that it contained many calcites and some aluminum and it was then crystalized but compact; that it was metamorphosed while in its present position in many places, by the removal of the calcites and aluminum which has made it porous and pure silica as we find it; that rainwater was an active agent in dissolving and removing them by a slow filteration; that in deep quarries the aluminum was deposited in the cleavage seams and clay strata while the calcites were dissolved and the lime passed away in solution through the sand strata; that where there is no flow of surface water the calcites remain as in the original rock; and where there is a flow of water and no sand strata, but a close foot wall below the leads, the rock near the surface may be porous and have grit, but in a few feet of depth is hard and vitreous with no grit.

In all tests by analysis, weighing of wet and dry samples and actual use of whetstones, the rock from the deepest quarries situated above a sand and clay strata are the purest in silica, and most porous and uniform in crystalization and the sharpest grit, and though many quarries have been worked out and abandoned, there is fortunately plenty of the best grade of this rock for the demands of trade many years to come.

The reputation of Washita stone has been damaged some in recent years by the sale of poor grades on the markets, but most carpenters know that a good Washita oilstone is the best whetstone in the world. They are sold in all civilized countries and the rock is all quarried in Arkansas.

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BLUESTONE.

Johnson county abounds in this species of sandstone and the quarries at Cabin Creek furnish large quantities of stone which are shipped to Little Rock principally, where they are used for flagging, rubble masonry, retaining walls and bridge stones, sidewalks, crosswalks, curbing, gutters, step-stones, flooring, vault covers, bases of tombstones, porch and hitching posts, well covers and house trimmings. Blue-stone is also found in Pulaski county and in other parts of the state. It is now a valuable industry and the demand for this stone increases each year. Some of the handsom-est foundations in Little Rock are made with this stone.

SANDSTONE.

The whole western side of Arkansas is underlaid with metamorphosed sandstone and quarries have been opened in Washington, Carroll, Crawford, Sebastian, Johnson, Pu-laski and Independence counties for commercial purposes. It is used for all purposes for which bluestone is used. It has many colors and is growing in popularity. The Bates-ville variety has a great reputation. Arkansas stood twenty-fourth in actual production in 1890, having produced an output valued at $25,074. When it is known that in 1880 this interest had not been developed its importance will be appreciated. Eight quarries are in successful operation.

Of the 210,000 cubic feet quarried in 1889, 139,000 feet were used for building purposes; 27,160 feet for street work, and 42,900 feet for bridge, railroad and miscellane-ous purposes. Arkansas ranked twenty-seventh in the value of her sandstone for building purposes; ninth for street purposes, and fourth for miscellaneous purposes. She ranked twenty-fifth as to cubic feet used for building purposes, eleventh for street purposes and sixth for miscel-laneous purposes. The average yearly earning of laborers is greater in Arkansas than in Arizona, Illinois, Indiana,

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New Hampshire, Kentucky, Maryland, New Mexico, Tennessee, Texas, South Dakota, Virginia, West Virginia and several other states.

The following additional items will show particulars not pointed out before which are of great value to the estimate placed upon this industry.

Total number of cubic feet quarried	210,010.
Total value of product	$25,074.
Total wages	11,287.
Total expense	12,860.
Total capital	17,660.
Percent profit on capital	69.16.
Per cent profit on value of product	48.71.
Cost per cubic foot of production	.06.
Percentage of wages to total expense	87.77.
Wages paid per cubic foot	.05.
Percentage of wages to total value	45.01.
Value per cubic foot	.12.

MANGANESE.

The census of 1890 contains this language: "By far the larger proportion of manganese in the United States is mined in three localities—Cremonia, Virginia; Cartersville, Georgia; and Batesville (Independence county), Arkansas." Of the 23,927 tons of manganese produced in the census year, 20,325 tons were from these three districts. The following is the exact production:

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PRODUCTION OF MANGANESE ORES IN THE UNITED STATES IN 1889.

STATES.	Production.	Total Value.	Value Per Ton.	Employes.	Wages.	Capital.
Total	23,926	$238,939	$9.99	432	$123,858	$2,094,475
Arkansas	2,528	23,173	9.17	96	33,191	120,000
California	53	901	17.00	10	1,149	2,400
Georgia	5,208	50,143	9.63	117	19,486	175,125
Nevada	15	82	5.53	2	53	600
North Carolina	17	170	10.00	2	60	250
South Carolina	124	744	6.00	6	400	5,000
Tennessee	30	120	4.00	3	70	100
Vermont	1,336	7,348	5.50	25	3,510	.....
Virginia	14,616	156,257	10.69	171	65,939	711,000

Arkansas ranks third in the production of this important mineral, and is rapidly increasing its production. The mining is continuous throughout the year. Besides the Batesville district the region around Little Rock in Pulaski and Saline counties, and further to the southwest in Polk county abounds in manganese. No systematic mining efforts have been begun, and the value and quantity of the ore in this region is still unknown. The following table will show the growth of this industry since its beginning in Arkansas:

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PRODUCTION OF MANGANESE ORES IN THE UNITED STATES.

STATES.	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889
Total	5,761	4,895	4,532	6,155	10,180	23,258	30,193	34,524	29,198	23,927
Virginia	3,661	3,295	2,982	5,355	8,980	18,745	20,567	19,835	17,6 6	14,616
Arkansas	.....	100	175	400	800	1,483	3,316	5,651	4,312	2,528
Georgia	1,800	1,200	1,000	.....	.....	2,580	6,041	9,024	5,568	5,208
Other States	300	300	375	400	400	450	269	14	1,672	1,575

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IRON DEPOSITS OF ARKANSAS.

BY R. A. F. PENROSE, JR., ASSISTANT GEOLOGIST ARKANSAS GEOLOGICAL SURVEY.

The history of iron mining and manufacture in Arkansas is told in a few words. At the present time (1892) no iron ore is being mined and no iron is being manufactured in the state. Two small bloomaries were operated in the northern part of the state for short periods before 1860, and the limited products of those works represent all the iron ever manufactured in Arkansas. Besides the small quantities of ore taken from local deposits to supply these bloomaries, no iron ore has been mined in the state except in prospecting. Prospecting, however, has been done in many places, and the numerous small openings wherever iron ore has been discovered attest to the endeavors that have been made to find it in quantities.

The two bloomaries already referred to were known as the Bevens Bloomary and the Beach Iron Works, and were situated respectively in the northeastern and northwestern parts of the state. They were both operated for only short periods of a few years at the most, and both had already been abandoned in 1860. They were built to supply a purely local demand, and the conditions that permitted their existence were the lack of transportation facilities, there being at that time no railways in the northern part of the state, and the consequent difficulty of obtaining iron from outside sources. They attained their purpose in this respect, and supplied a serviceable iron for agricultural implements, wagon tires and other such articles. The abandonment of the bloomaries in both cases is said to have been caused by the limited market for the iron, as there were only sparsely settled country districts to supply. To this cause also may probably be added the inexperience of the operators of the bloomaries.

Though the only two iron-producing works ever erected

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in Arkansas were thus brought to an early end, yet the improved transportation facilities a few years later and the resulting influx of cheap iron and cheap farming implements would probably have caused their abandonment even if they had previously been profitably operated. Whatever success they may have attained depended upon their protection against outside iron, and this protection was due to the comparative inaccessibility of the region at that time; but when the protection was removed by the introduction of transportation facilities, their small capacity, crude methods, and, in the case of the Beach iron works, the scarcity and poor quality of the ore would inevitably have caused their abandonment.

The Bevens bloomary was situated on Big creek, in the southeastern part of Sharp county, six miles southwest of Smithville, in 16 N., 4 W., the east half of section 24. It was built in 1857 by Alfred Bevens & Co., and was run for two or three years, when operations were stopped on account of the limited market for the iron produced. At the present time most of the bloomary has been swept away or covered with sand by the overflows of Big creek. The ores for the bloomary were obtained from the local deposits in the neighborhood, in Sharp and Lawrence counties.

Dr. D. D. Owen, in referring to the Bevens bloomary after his visit there in 1857–58, says: "It has two fires, and is driven by a good water power. When visited, this forge was undergoing thorough repairs, and preparations were being made to introduce the hot blast in place of the cold blast, formerly in use, by which alteration it was expected to increase the amount of swaged bar iron manufactured from 500 to 1,600 pounds per day." Prof. J. P. Lesley, however, in speaking of the Bevens bloomary somewhat later (1859), says: "It was built in 1857, with two fires and one hammer driven by water, and makes 250 pounds of swedged iron per day with cold blast, out of brown hematite ore."

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The Beach iron works consisted of a bloomary and were situated in the central part of Carroll county, on the east side of Osage creek, less than a mile above its confluence with King's river It is said to have been erected in 1850, or soon thereafter, and to have been abandoned before 1860, in which year it was destroyed by a freshet. Full records concerning it are at present unobtainable. It was built by an Englishman named Abram Beach, and it is said by some to have been worked for several years; by others, for only a few months. At any rate, it was run on only a small scale and for a short time. Like the Bevens bloomary, it was built to supply a local demand, and, as in case of the latter, the cause that permitted its existence and operation was the difficulty of obtaining iron from outside sources. The ore for the Beach bloomary was obtained from the local deposits of Carroll county, in the vicinity of Berryville.

DISTRIBUTION OF IRON ORE IN ARKANSAS.

Iron ore is of common occurrence throughout many parts of Arkansas, but in only a few places is it found in important quantities. The largest and most accessible deposits yet discovered are in the northeastern part of the state, especially in Lawrence and Sharp, and to a lesser extent in Fulton and Randolph counties. Other deposits, however, of varying size and importance, occur in many places in the part of the state west and north of the line of the St. Louis and Southwestern railway ("Cotton Belt route").

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IRON ORE LOCALITIES IN ARKANSAS.

Number.	LOCALITY.	Iron.	Silica.	Phosphorus.	Sulphur.	Manganese.	ANALYZED BY
	NORTHEASTERN ARKANSAS.						
	LAWRENCE COUNTY.						
1	Coffman tract, 17 N., 1 W., Sec. 17, S. ½ S. E.	55.75	5.20	0.041	0.212	A little	A. E. Menke.
2	Holloway tract, No. 1, 16 N., 2 W., Sec. 6, S. E.	53.91	7.08	0.028	0.198	A little	A. E. Menke.
3	Holloway tract No, 2, 17 N , 3 W., Sec. 35, N. E., S. E	45.49	8.47	0.007	0 315	A little	A. E. Menke.
4	Cazort tract, 16 N., 2 W., Sec. 6, N. W., S. W.	41.71	28.26	0.014	0 282	A little	A. E. Menke.
5	Holloway & Collins tract, No. 1, 16 N., 3 W., Sec. 12, S. E	49.44	25 85	0 028	0.479	A little	A. E. Menke.
6	Holloway & Collins tract, No. 2, 16 N., 3 W., Sec. 12, W. ½, W. ½	47 99	15.08	0 083	0 054	A little	A. E. Menke.
7	Wasson tract, No, 1, 17 N., 3 W., Sec. 26, S ½	41.58	16 26	0.093	0 095	A little	A. E. Menke.
8	Sloan tract, 17 N., 3 W., sec. 28, W. ½, N. E.	40.10	12.54	0.042	0 637	A little	A. E. Menke.
9	Strawberry or Cathaytown, 16 N., 3 W., Sec. 12, S E.	36 30	30.87	0 041	0.205	None	A. E. Menke.
10	Strawberry or Cathaytown, 16 N., 3 W., Sec. 12, S. E.	27.35	52.58	0.284	0.034	None	A. E. Menke.
	SHARP COUNTY.						
11	Collins tract, 16 N., 4 W., Sec. 8, S. W.	58 91	2.46	0.083	0.109	Trace	A. E. Menke.
12	Wasson tract, No. 2, 16 N., 4 W., Sec. 13, E. ½, S. E.	54 70	2.80	0.021	0.458	None	A. E. Menke.
13	Big creek and Reed's creek divide, 16 N., 4 W., Sec 36, N. ½	23.67	58.12	0 306	0.178	None	A. E, Menke.
	FULTON COUNTY.						
14	Deadrick tract, 20 N., 6 W., Sec. 1.	44.97	21.40	0.031	0.109	None	A. E, Menke.
	RANDOLPH COUNTY.						
15	Near Ravenden Springs	50.49	12.60	0 041	0.102	A little	A. E. Menke.
16	Odom tract, 18 N., 1 W., Sec. 18, N. E., N. E.	44.44	11.83	0.021	0.157	A little	A. E Menke.
17	Iron bank, 21 N., 3 W., Sec 8, N. E., S. W.	49.97	14.58	0.014	0.082	Trace	A. E. Menke.

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IRON ORE LOCALITIES IN ARKANSAS—*Continued.*

Number.	LOCALITY.	Iron.	Silica.	Phosphorus.	Sulphur.	Manganese.	ANALYZED BY
	NORTHWESTERN ARKANSAS.						
	CARROLL COUNTY.						
18	Bobo tract, near Berryville	47.33	5 36	0.028	0.287	A little	A. E. Menke.
19	Mack Thomas tract, near Berryville	45.01	6.82	0.035	0.301	A little	A. E. Menke.
20	Brooks tract, near Berryville	21.96	50.42	0.299	4.486	None	A. E. Menke.
	WASHINGTON COUNTY.						
21	Near Tolu, 14 N., 33 W., Sec. 16, N. W	13.62	60.80	0.046	.....	.403	R. N. Brackett.
	ARKANSAS VALLEY.						
	VAN BUREN COUNTY.						
22	McGruder tract, near Choctaw	24.40	40.44	0.276	0.178	A little	A. E. Menke.
23	Lick mountain, near Choctaw	20,98	13.78	0.524	0.123	A little	A. E. Menke.
	POPE COUNTY.						
24	Guest tract, near Russellville	24.40	46.36	0.242	0.164	Trace	A. E. Menke.
25	Bowden tract, 8 N., 19 W., Sec. 17, N. E., N. E	38.55	18.42	0.262	0.054	None	A. E. Menke.
26	Barton tract, 8 N., 19 W	17.56	62,64	0.312	0.178	Trace	A. E. Menke.
	LOGAN COUNTY.						
27	Freeman's Gap, near Paris	19.76	36.32	0.241	0.137	None	A. E. Menke.
	SEBASTIAN COUNTY.						
28	Wild Cat mountain, near Fort Smith	17.81	10.84	0.414	0.411	A little	A. E. Menke.
	SCOTT COUNTY.						
29	"Near Mansfield," 4 N., 30 W., Sec. 6	14.15	51.50	0.286	0,049	None	A. E. Menke.
	CRAWFORD COUNTY.						
30	Shay tract, near Lancaster	17.08	40.30	0.274	0,260	A little	A. E. Menke.
31	Near Chester	15 37	42.54	0.184	0 054	A little	A. E. Menke.
32	Basham tract, near Chester	28.30	37.22	0.252	0.123	A little	A. E. Menke.

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Number.	LOCALITY.	Iron.	Silica.	Phosphorus.	Sulphur.	Manganese.	ANALYZED BY.
	OUACHITA MOUNTAINS.						
	PULASKI COUNTY.						
33	Capitol L. & M. Co. tract, 1 N., 14 W., Sec. 24, N. E.	33.89	44.91	0,160	.....	0.39	R. N. Brackett.
34	" " " " " " " " S. E. N. W.	14.82	63.19	0,270	.....	8 08	" "
35	Whittemore & Bunch tract, 1 N., 14 W., Sec. 14, N. E. S. W.	27.07	46.37	0,470	.....	1.62	" "
36	R. W. Worthen tract, 1 N., 13 W., Sec. 19, S. W. S. W.	6.10	75.02	0.184	1,137	None	A. E. Menke.
37	" " " 1 N., 14 W., Sec. 14, N. E. S. W.	53.42	22.48	0,500	.....	Trace	R. N. Brackett.
	SALINE COUNTY. (Northern Part).						
38	Iron Mountain, 2 N., 16 W., Sec 18, S. E.	35 74	42.79	0,140	.....	A little	" "
39	" " " " " " " "	11.34	50.60	0,276	0,082	None	A. E. Menke.
	GARLAND COUNTY.						
40	Rector & Roulston claim, No. 1, 4 S., 19 W., Sec. 3, S. E.	57.54	2.96	0,670	.....	None	W. A. Noyes.
	HOT SPRING COUNTY.						
41	Conley-Sullivan claim, 4 S., 20 W., Sec. 26, N. W. S. E.	14.15	11.29	0 560	.....	41.54	" "
42	Magnet Cove, 3 S., 17 W., Sec. 20, S. W.	68.58	5.86	0,028	0,191	A little	A. E. Menke.
	MONTGOMERY COUNTY.						
43	Bud Jones' claim, No. 1, 3 S., 23 W., Sec. 22, S. E., N. E.	61,99	1.53	0.200	.....	0.04	W. A. Noyes.
44	" " No. 3, 3 S., 23, W., Sec. 29, N. 1-2.	54.54	0.84	1,790	.....	0 30	" "
	POLK COUNTY.						
45	J. Guy Lewis' claim, 4 S., 28 W.	16.22	19 32	0.778	0,137	Trace	A. E. Menke.
46	Pointed Rock Tunnel, 4 S., 28 W., Sec. 19.	14.51	41 40	0,191	0,082	A L tle	" "
47	Arkansas Development Co. claims.	25.53	0.80	0.767	.....	40 51	St. L. S. & T. Wks
48	" " " "	35.39	1.88	0,230	.....	27.68	" "
49	" " " "	16.83	29 00	0.343	.....	26.20	" "
50	" " " "	23.26	44.40	0,570	.....	11.93	" "
51	" " " "	50.38	.....	1,450	.....	2.06	" "
	SOUTHERN ARKANSAS.						
	SALINE COUNTY (Southern Part).						
52	R. W. Worthen tract, 3 S., 13 W., Sec. 6.	40.24	30 26	0,670	.....	Trace	R. N. Brackett.
53	" " " " " "	23.57	2,96	0,193	0,548	A little	A. E. Menke.

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Number.	LOCALITY.	Iron.	Silica.	Phosphorus.	Sulphur.	Manganese.	ANALYZED BY
54	Young tract, 2 S., 14 W., Sec. 33, N. E	21.10	23.86	0.110	0.178	"	A. E. Menke.
55	Frank Davis tract, 2 S., 14 W., Sec. 1	20.98	2.12	0.262	0.452	Trace	" " "
56	Claiborns tract, 2 S., 14 W., Sec. 10	14.34	3.46	0.124	0.274	A little	" " "
57	Wm. Herr tract, 2 S., 14 W., Sec. 3, E 1-2, S. W	21.96	6.68	0 317	0 041	"	" " "
	DALLAS COUNTY.						
58	Griswold's Mill, 10 S., 16 W., Sec. 4	30.67	40.48	0.704	.....	None	R. N. Brackett.
59	" " " " "	37.73	25.87	0 225	.....	Trace	" "
	OUACHITA COUNTY.						
60	Five Miles West of Camden, 12 S., 18 W	26,15	52.16	0.588	.....	None	" "
61	Wm. Brown tract, 12 S., 18 W	35.68	35.95	0.280	.....	"	" "
	NEVADA COUNTY.						
62	Vicinity of Rosston, 13 S., 21 W	57.17	4.27	0.225	.....	Trace	" "
63	" " " " "	50 20	10.65	0.424	.....	"	" "
64	" " " " "	38,80	26.57	0.119	.....	None	" "
65	" " " " "	30.85	50.63	0.223	.....	"	" "
66	" " " " "	22.08	58.73	0.085	.....	"	" "
	HEMPSTEAD COUNTY.						
67	Eight Miles North of New Lewisville	26.47	52.10	0.201	.....	"	" "
68	" " " " "	27.31	53.32	0.136	.....	"	" "
	LAFAYETTE COUNTY.						
69	Boyd Farm, near New Lewisville	38.13	26.78	0.139	.....	"	" "
70	" " " " "	19.68	65.82	0.137	.....	"	" "

The analysis in this table were made by the Chemists of the Survey, with the exception of Nos. 47-51 inclusive, which were made at the St. Louis Sampling and Testing Works, Prof. W. B. Potter, Manager, and which have been kindly furnished the Survey by Mr. W. E. Barnes, editor of the *Age of Steel*, St. Louis, Mo.

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AGRICULTURAL MARLS AND CHALKS OF ARKANSAS.

The following extract from the Arkansas Geological Survey shows the nature and extent of articles:

No region of the world is more plentifully and conveniently endowed with such valuable natural marls and chalks than Arkansas, nor is there any region which could be so greatly benefitted by their use. We have here large areas of soil especially deficient in the very ingredients which are so plentifully stored up in our marls. Many farmers endeavor to cultivate soils which are pure commercial marls, in which there is entirely too much lime, as in some of the black land regions, while others cultivate land entirely deficient in lime, potash, etc., which might readily be supplied by using the natural marls. Large tracts like the prairies east of the Iron Mountain railway, now lying idle, might be made the most fertile and profitable lands in the state.

The marls used most frequently throughout the world are of five general types, only one of which usually occurs in any single geographic area. These may be classified as follows:

1. *Phosphatic Marls.*—Those rich in phosphates, of rare occurrence and of great commercial value. Example, the tertiary marl beds of South Carolina.

2. *Greensand, or Glauconitic Marls.*—Those composed mostly of the glauconite (a silicate of iron and potash) and sand. These are often comparatively poor in lime. Example, the marls of New Jersey.

3. *Lime, or Calcium Carbonate Marls.*—These marls are rich in lime as an essential, mixed with clay, greensand, or other accessory minerals. They form 20 to 75 per cent of the material. Example, lime marls of England.

4. *Chalk Marls* are lime marls in which the calcium carbonate is so much in excess as to compose nearly the entire

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mass, usually over 85 per cent of the whole. Example, the chalks of England and France.

5. *Gypsum, or Sulphate of Lime Marls* are those in which the fertilizing element is the sulphate of lime. This fertilizer is usually spoken of as land plaster.

All these kinds of marl seldom, if ever, occur in the same formation or in close proximity to each other, but usually each occurs alone in widely separated regions. Thus it happens that the marls of South Carolina are of the highly phosphatic character; those of New Jersey mostly greensands or glauconite; those of England and France mostly lime and chalk, while gypsum occurs at other places. In view of these facts it is very remarkable that in Arkansas, within a small triangular area of thirty miles square between Washington and Murfreesboro and the White Cliffs of Little River we have abundant supplies of at least four of these valuable kinds of marl, greensand, lime, chalk and gypsum, with the reasonable expectation that another year's investigation would reveal the phosphates. These facts alone, if properly utilized, will be of greater value to the state than all the gold dug within the bounds of California has been to that state.

The marls of Arkansas may be classified according to their local distribution as follows:

I. THE TERTIARY MARLS OF EASTERN ARKANSAS.

1. It has not been in the province of the writer's investigation to study the tertiary marls of Crowley's Ridge, and they are only mentioned here for purpose of comparison. As the value of marls is greatly dependent upon their convenience to the consumer, it is not necessarily derogatory to the local value of the tertiary marls of St. Francis and other counties to say that although valuable they are inferior to the cretaceous marls of the southwestern part of the state, possessing in general more sand and much less lime than the latter.

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II. THE CRETACEOUS. MARLS OF SOUTHWEST ARKANSAS.

2. The upper cretaceous or greensand marls found in the geologic horizon of the Washington or High Bluff sands, in Clark and Hempstead counties, and in the beds of Little River, at Morris' Ferry, in Little River county.

3. The middle upper cretaceous, or lime marls of the Big Deciper. *Gryphaea vesicularis* and *Exogyra ponderosa* horizons, varying in quantities of calcium carbonate and sand from 10 per cent of the former and 50 per cent of the latter as the geologic column is descended, to 75 per cent of the former to 10 per cent of the latter; and also varying in quantities of accessory clay and greensand. These marls occur in Clark and Hempstead counties at the horizons mentioned.

4. The basal upper cretaceous or chalk marls of the White cliffs of Little River, containing more than 90 per cent of calcium carbonate and the Rocky Comfort chalk, containing more than 85 per cent of lime.

5. The Comanche series, *Gryphaea pitcheri* marls at and south of Cerro Gordo, containing a little gypsum and much clay.

6. The Trinity gypsum marls of Plaster Bluff and other points between Murfreesboro and Ultimathule, containing from 10 to 95 per cent of gypsum or sulphate of lime.

The greensand marl at Washington is especially convenient to railway transportation. If reasonable freight rates could be arranged, they should be freely used both on the plateau gravel or red lands, and on the Prairie d'Ane and Prairie de Roan clays and on the prairies of the eastern part of the state.

COAL.

Total product in 1891, 542,379 short tons; spot value, $647,560.

Compared with the product of 1890, the output in 1891 shows a gain of 142,491 tons and an increase of value of

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$132,965, the product in the former year being 399,888 short tons, worth $514,595. The increased product is due to the opening of new mines by the Kansas and Texas Coal Company, and more extensive operations by the Western Coal and Mining Company, the mines of which are located in Sebastian county. The output of the other two producing counties was not materially changed. The total number of men employed in 1891 was 1,317, who worked an average of 214 days, against 938 men for the same number of days in 1890. The increased production, however, was attended by a decline in the average price per ton, from $1.29 in 1890 to $1.19 in 1891.

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COAL PRODUCT OF ARKANSAS IN 1891, BY COUNTIES.

COUNTIES.	Loaded at mines for shipment.	Sold to local trade and used by employes.	Used at mines for steam and heat.	Total amount produced	Total Value.	Average price per ton.	Number of days active.	Average number employed
	Short tons.	Short tons.	Short tons.	Short tons				
Johnson	78,223	1,100	667	80,000	$112,000	$ 1.40	193	185
Pope	4,850	50	100	5,000	15,000	3.00	100	40
Sebastian	435,047	1,759	14,573	451,379	508,560	1.13	222	1,092
Small mines		6,000		6,000	12,000			
Total	518,120	8,900	15,350	542,379	$647,560	$ 1.19	214	1,317

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ANNUAL PRODUCTION OF COAL IN ARKANSAS FROM 1882 TO 1891.

YEARS.	Short tons	YEARS.	Short tons
1882	5,000	1887	129,600
1883	50,000	1888	276,871
1884	75,000	1889	279,584
1885	100,000	1890	399,888
1886	125,000	1891	542,379

JOHNSON COUNTY.

The product in 1891 decreased 9,000 tons compared with 1890, the difference in value being $18,927. The mines gave employment to 185 men in 1891 against 215 men the previous year. The coal is shipped from the collieries at Coal Hill over the Little Rock & Fort Smith railroad. The annual product of this county since 1887 has been as follows :

COAL PRODUCT OF JOHNSON COUNTY, ARKANSAS, SINCE 1887.

YEARS.	Short tons	YEARS.	Short tons
			89,000
1887	71,900	1890	80,000
1888	106,037	1891	
1889	105,998		

POPE COUNTY.

The output in 1891 was 5,000 tons, valued at $15,000, an increase of 1,000 tons over the product of 1890. The coal is classed as a semi-anthracite and is consumed chiefly in Little Rock and Fort Smith for domestic purposes, being shipped over the Little Rock & Fort Smith railroad to those cities.

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COAL PRODUCT OF POPE COUNTY, ARKANSAS, SINCE 1887.

YEARS.	Short tons	YEARS.	Short tons
1887	8,200	1890	4,000
1888	10,240	1891	5,000
1889	6,014		

SEBASTIAN COUNTY.

Sebastian county in 1891 produced 83 per cent of the total output of the state, with 451,379 short tons valued at $508,560. The Kansas and Texas Coal company, and the Western Coal and Mining company, both of St. Louis, are the principal operators, the former shipping its product from Huntington over the St. Louis & San Francisco railroad, and the latter from Jenny Lind over the St. Louis, Iron Mountain & Southern railroad. The output of the county in 1891 was 50 per cent greater than the preceding year, being 451,379 short tons, against 300,888 short tons. The value did not increase as much in proportion, being 40 per cent more than in 1890, or $508,560, as against $363,668. The Sebastian county mines gave employment to 1,092 men for an average of 222 days. In 1890 the number of men employed was 683 for 214 days.

COAL PRODUCT OF SEBASTIAN COUNTY, ARKANSAS, SINCE 1887.

YEARS.	Short tons	YEARS.	Short tons
1887	39,500	1890	300,888
1888	160,594	1891	451,379
1889	165,884		

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TABLE OF ANALYSIS OF ARKANSAS COALS, CLASSIFIED ACCORDING TO THEIR FUEL RATIOS*

No. of Sample.	GENERAL INFORMATION.				PHYSICAL PROPERTIES.			CHEMICAL COMPOSITION.					Fuel Ratio	RESULTS OF LABORATORY COOKING TESTS.	
	Name of Pit or Mine.	County.	Thickness of Coal. Ft. | In.	How Sampled.	Appearance.	Specific Gravity.	Color of Ash.	Water Pr. Ct.	Sulphur. Pr Ct	Ash. Pr Ct	Fixed Carbon Pr. Ct.	Vol. Hydro Carbo's Pr Ct	C. v.H c	Appearance of Product.	Per Cent of Product.
	BITUMINOUS.														
1	Carnall's drift.....	Sebasti'n	3 10	From pile in drift, been dug 2 years	Shaly and friable.....	1.469	Pinkish red.	5.259	1.491	13.620	61.975	17.655	3.51	Product not at all fused, fragments retain their original shapes.....	77.4
2	Page's pit.	Sebasti'n	2 -|-	From fresh fragments at mouth of pit.	Shaly, pyrites films, mineral charcoal ...	1.300	Reddish gray.	0.852	1.235	3.297	78.222	16.394	4.77	Product well fused and took the shape of the crucible...	81.2
3	axley pit.....	Logan ...	2 6	From pile at mill in Paris, dug 8 mon's.	Somewhat shaly, rather compact.	1.295	Light red.	1 282	2.407	5.281	75.335	15.745	4.79	Product well fused and took the shape of the crucible...	83.0
4	Hacket City shaft, Kansas and Texas Coal Co	Sebasti'n	3 0	From five market cars	Shaly and friable.....	1.341	Pinkish gray.	0.853	1.324	9.038	73.869	14.916	4.95	Product well fused and roughly took the shape of the crucible	82.3
5	Pickartz's drift...	Franklin	2 0	From pile fresh coal on dump...	Shaly with iron stain..	1.308	Brick red.	0.702	0.862	3.561	78.898	15.877	4.98	Product well fused and took the shape of the crucible...	82.6
6	Huntington slope, Kansas and Texas Coal Co	Sebasti'n	6 6	From two market cars	Very friable, somewhat shaly	1 293	Reddish brown.	0.928	1.143	4.845	77.538	15.546	4 99	Product well fused and took the shape of the crucible...	80 6
	SEMI-BITUMINOUS.														
7	Claiborne's pit ..	Sebasti'n	5 6	From fresh face of coal in pit	Slightly shaly, very friable	1.303	Bright red.	0.943	1.152	4.008	78.355	15.542	5.04	Product well fused, but roughly took shape of crucible	8.10

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8	Lewis' pit.....	Franklin	1 2	From pile at pit, dug 1 year.....	Shaly and very friable	1.320	Dark red.	0.883	2.451	4.286	77.200	15.280	5 07	Product well fused and took shape of crucible.....	81.0
9	Mc'Connell's shaft.....	Sebasti'n	2 9	From pile fresh coal on dump...	Quite shaly and friable.	1.296	Light red.	0 600	1.142	4.579	78.208	15.381	5.09	Product well fused and took roughly the shape of crucible.....	83.6
10	Glenwood shaft..	Sebasti'n	6 0	From pile fresh coal on dump...	Somewhat shaly, but rather compact....	1 300	Drab.	0.818	2.522	5.975	75.821	14.866	5.10	Product well fused and took the shape of the crucible...	83.6
11	Sullivant and Boling	Crawford	1 2	From small pile at pit, dug 1 year.	Shaly and slightly friable..	1.366	Dark lavender.	0.761	4.958	14 200	67.131	12.950	5.19	Product well fused and took roughly the shape of the crucible	82.8
12	Bocquin and Reutzel shaft...	Sebasti'n	5 0	From pile fresh coal on dump...	Slightly shaly and friable.....	1.342	Lavender red.	0.746	1.404	5.003	77 867	14.980	5.20	Product irregularly fused, fragments well fused.....	81.6
3	Gwyn's drift.....	Sebasti'n	4 10	From pile fresh coal on dump..	Rather friable and shaly	1.315	Pink.	0 892	1.193	6.245	77.092	14.577	5 29	Product very well fused and took shape of crucible.....	82.2
14	Carlan's slope....	Logan....		From small pile at slope, dug 1 month	Brittle, a little pyrites	1.313	Brownish red.	0.846	1.373	4.710	78.401	14.670	5.34	Product well fused and took the shape of the crucible...	83.3
15	Moomaw's pit...	Franklin	1 8	From scat'd fragments, recent'y dug	Shaly, with pyrites.....	1 352	Yellowish red	0.663	1.366	3.272	79.812	14.987	5.36	Product well fused and took the shape of the crucible...	82 2
16	Grave's drift.....	Crawford	1 6	From pile fresh coal at drift.....	Hard, but brittle and somewhat shaly.....	1.313	Dark lavender.	0.566	2.853	7 614	75.066	13.901	5.40	Product well fused and took the shape of the crucible...	82.3
17	Petty's slope	Sebasti'n	5 0	From pile fresh coal on dump...	Shaly and friable.....	1.384	Lavender red.	1.779	1.620	7.046	76.225	13.330	5.72	Product well fused and took roughly the shape of the crucible	83.04
18	Philpott shaft....	Johnson.	1 9	From pile fresh coal on dump..	Rather friable, somewhat shaly	1,292	Yellowish red.	0.869	0.993	3.090	80.915	14.133	5.73	Product well fused and took shape of the crucible.....	84.6
19	Watt's slope.....	Sebasti'n	3 10	From scattered fragments, recently dug	Slightly shaly and friable.....	1.392	Dark lavender.	0.743	4.066	9.965	72.608	12.618	5.75	Product not thoroughly fused and took roughly the shape of the crucible...	83.0

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20	Felker slope	Franklin	1 8	From large pile on dump dug 6 mont's	Rath'r shaly, somewhat friable	1.317	Yellowish red.	1.128	1.164	3.220	81.277	13.211	6.15	Product partially fused, but fragments partly retain original shape	85.0
21	Ouita slope, Ouita Coal Co.	Pope	2 6	From one market car	Rath'r shaly, not very friable, little calcite	1.339	Yellowish brown.	0.980	1.829	8.174	76.817	12.200	6.29	Product not at all fused, fragments retain their original shapes	87.6
22	Eureka shaft, Stiewel & Co.	Johnson.	3 0	From one market car	Compact, not very shaly	1.345	Brownish drab.	1.100	2.745	12.042	72.835	11.278	6.46	Product not at all fused, fragments retain original shapes	89.2
23	Coal Hill shaft, Stiewel & Co.	Johnson.	3 10	From one market car	Slightly shaly, not very friable, calcite films	1.333	Drab.	1.017	3.672	8.351	76.119	10.841	7.02	Product partially fused, fragments retain somewhat original shapes	87.2
24	Allister slope, Ouita Coal Co.	Johnson.	3 7	From two market cars	Slightly friable, calcite films	1.320	Drab.	1.178	3.531	8.322	76.494	10.475	7.30	Product partially fused, fragments little changed	86.5
25	Mason's drift	Johnson.	1 4	From small pile, dug 1 year previo's	Very friable	1.339	Yellowish red.	1.116	1.155	5.863	80.860	11.006	7.34	Product slightly fused, and fragments retain roughly original shapes	86.7
26	Harkreader's well	Johnson.	3 6(?)	From small block, dug one year	Shaly and slightly friable	1.318	Dark brownish red.	1 563	2.867	6.313	78.910	10.347	7 62	Product not at all fused, fragments retain original shapes	86.6

SEMI-ANTHRACITE.

27	Shinn slope	Pope	1.10	From fresh face of coal	Compact, little shale and pyrites, calcine films	1.346	Pinkish gray.	1.058	3.346	11.750	75.434	8.410	8.96	Product not at all fused, fragments retain original shape	88.4
	Mean of the twenty-seven samples					1.331		1.114	2.009	6.763	76.276	8.739	5.792		83.654

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REFERENCE LIST.	AUTHORITY.										
Connellsville coal, Pennsylvania, standard coking coal	E. V. d'Invilliers			1.260	.784	8.233	59.616	30 107	1.98	Product well fused and took shape of crucible	
Flat top, Pocahontas coal, Virginia; "semi-bituminous" coking coal	E. V. d'Invilliers			1.011	.730	5 191	74.256	18.812	3.95	Product fused and took shape of crucible	78.6 84.43
Charleroi, France, produces well-formed coke	Percy					3.55	80.38	15.57	5.2		
Westmoreland Gas Coal company, Pennsylvania, gas and coking coal	E. V. d'Invilliers			1.427	.718	5.418	54.921	37.521	1.46		
Cumberland coal, Maryland, "semi-bituminous," excellent steaming coal	E. V. d'Invilliers			0.958	0.787	6.408	72.708	19.139	3.79		
Broad top coal, Pennsylvania, "semi-bituminous," good forge and steaming coal	E. V. d'Invilliers			0.594	0.976	9.545	71.334	17.551	4.07		
Bernice coal, Pennsylvania, semi-anthracite, good steaming and domestic coal	McCreath		Gray.	1.295	1 031	6.230	*3.344	8,100	10.30		
Wilkesbarre, Pennsylvania, anthracite	McCreath	1.614	Reddish	2.493	0.658	8.544	83.967	4.342	19 33		
Belleville coal Illinois, average for six mines	Worthern	1.300	gray.	6.420		7.560	48.990	37 140	1.32		
Corona coal, Alabama	Smith	1.320		1.550	0 950	1 900	58.810	37.740	1.56		
Rich Hill coal, Missouri	Potter			5.050		16 050	44.500	34 400	1.29		
Kansas coals, average of thirty-eight samples	Bailey			4 792		10.193	45.396	39.617			
St. Bernard Coal company (No. 11) Western coal fields, Kentucky	Proctor			4.720	2.980	6.130	53.510	36.000	1.49		

*The analyses of Arkansas coals were made by Dr. R. N. Brackett, chemist of the survey, and Mr. J. P. Smith, assistant.

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BRICK CLAYS.

The soils derived from the sandstones and shales of the state are well adapted to brick making Rocks of these kinds are most abundant along the faces of the Boston mountains and its outliers containing the sandstones and shales of the millstone grit. The brick clays will be found especially abundant and good on the plains that adjoin the bases of these hills and mountains. Here the soils derived by decay from the higher rocks have accumulated and have been turned over and tempered by natural processes, while the too fat clays have been removed by water. Of course there are many other places than these where the conditions for the formation of good brick earths have prevailed. In places the lowlands along streams are covered with brick earths to a depth of from 2 to 10 feet.

The shales of Washington county, especially the Fayetteville shale and the coal bearing shale, are available for the manufacture of vitrified bricks and sewer pipes. The vitrified brick industry has assumed large proportions at Fort Smith, Arkansas. The principal streets of that city, of Little Rock and of Pine Bluff have been paved with brick manufactured at Fort Smith.

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BRICK STATISTICS OF WASHINGTON COUNTY, FROM VOL. I OF THE GEOLOGICAL SURVEY'S REPORT FOR 1889:

Place	No. of Yards	Make	Men Employed	Average Monthly Wages	Capital	Output for 1889	Value of Kiln	Repressed.
Fayetteville	2	Hand.	20	$650	$825.00	459,000	$8 to 10 per M Repressed $15	25,000
Springdale	2	1 hand. 1 machine.	15	390	3000.00	800,000	$6	

Brick kilns of much greater dimensions than these are regularly operated at Fort Smith, Little Rock and Malvern. Pressed brick are manufactured at Malvern.

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TIMBER.

NOTES ON THE FOREST TREES OF THE CROWLEY'S RIDGE REGION.

FROM BRANNER'S GEOLOGICAL SURVEY.

A few words in the way of general introduction may be allowed. In the first place there is a great similarity in the forests in the lowland region east and west of Crowley's Ridge. This similarity extends both to the species and their abundance. But the physical differences are not great and little else is to be expected. However, there are some minor facts of interest in the distribution of certain species. Cottonwood, for instance, is far more common in the valley of the St. Francis than in that of the L'Anguille. Beech is more abundant along the northern third of the ridge country than further to the south. The pine areas are very much restricted on the ridge, and are found only on those parts of it which are surmounted with sands and gravels; in other words, only where the the tertiary sands and gravels rise quite to the tops of the hills. It does not, as a rule, run far down the sides of the hills and is rarely found in the valleys. The cypress is abundant alike in the lowlands on both sides of the ridge, but it is seen at its best in the valley of the White river. The poplar does not appear to any extent at the tops of the hills, and where they are sandy it is never found; but in the valleys it is both abundant and large.

In the second place the forests are often very dense and the timber of a superior class. In many sections of this region the forests are still practically untouched and stand in all their original vigor. While certain modifications need to be understood for this statement concerning those localities which are along the railroads, it is quite true for the mass of the forest covered region, that is to say, for all eastern Arkansas except the small areas of prairie lands in the valley of the White river. It is true, also, that the habits of stock

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which seek mast are slowly modifying the nature of the forests by changing the nature of the undergrowths. Some they trample quite out of existence, other forms they seriously affect so that they are engaged in an uncertain struggle for existence. The oaks bearing bitter fruits are on the increase while those whose fruit is sweet are on the decline in respect to number of young trees growing in stock raising districts. The result is easy of interpretation. The newer forests will eventually be composed largely of the black oaks and similar forms with bitter mass.

A third feature of great interest lies in the encroachment of the forest areas on the few remaining prairies of eastern Arkansas. Few large prairies now remain, and the largest of these is the region west of and near DeVall's Bluff, that is, west of White river. About all these prairies are to be seen the advance guard of the forests, pushing their way into the treeless region in long straggling outlines of black jack, sassafras, willow, oak and blue ash. Mixed with them are a goodly number of sumach bushes of all sizes, and these are all reclaiming the lands of the forest.

The railways are modifying the character of the herbaceous vegetation to a marked degree all along their course. Many northern and western plants, seen nowhere else in eastern Arkansas, were noticed along the Iron Mountain railway. Some of the more common noxious weeds are being rapidly introduced. Many of the prairie regions, the source of most of the native hay of the eastern part of the state, are being claimed by these strangers. About Goodwin and through the Grand Prairie this encroachment of imported weeds is very marked.

Such further notes as may be of general interest may be found in connection with the several species mentioned in the subjoined list:

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REGISTER.

THE MAGNOSIA—(*Magnolia grandiflora*, Linnæus.)
THE CUCUMBER TREE—(*Magnolia acuminata*, Linnæus.)
MAGNOLIA—(*Magnolia mecrophylla*, Michaux.)
THE YELLOW POPLAR OR TULIP —(*Liriodendron tulipifera*, Linnæus.)
THE PAW-PAW—(*Asimina triloba*, Dunal.)
THE LINDEN OR BASS WOOD—(*Tilia Americana*, Linnæus.)
WAIT-A-BIT,— TEAR BLANKET)—*Xanthoxylum clava-herculis*, Linnæus.)
THE HOLLY—(*Ilex opaca*, Aiton.)
HOLLY—(*Ilex Decidua*, Walter.)
WAHOO—(*Euonimus atropurpureus*, Jacquin.)
(*Rhamnus Caroliniana*, Walter.)
BUCKEYE—*Aesculus*, sp. indt.)
RED LEAVED MAPLE—(*Acer rubrum*, Linnæus.)
SUMACH—(*Rhus copallina*, Linnæus.)
BLACK LOCUST—*Robinir pseudacacia*, Linnæus.)
COFFEE BEAN—(*Gymnocladus canadensis*, Lamark.)
THE HONEY LOCUST.—(*Gleditschia triacanthos*, Linnæus.)
WILD PLUM.—(*Prunus Americana*, Marshall.)
THE CRAB APPLE.—(*Pyruscoroniaria*, Linnæus.)
THE WITCH HAZEL.—(*Hamamelis vieginica*, Linnæus.)
SWEET GUM.—(*Liquidambar styraciflua*, Linnæus.)
FLOWERING DOG-WOOD.—(*Cornus florida*, Linnæus.)
BLACK GUM.—(*Nyssa sylvatica*, Marshall.)
TUPELO GUM.—(*Nyssa uniflora*, Wangenheim.)
THE PERSIMMON.—(*Diospyros virginiana*, Linnæus.
THE BLUE ASH.—(*Fraxinus quadrangulata*, Michaux.)
THE WHITE ASH.—(*Fraxanius Americana*, Linnæus.)
THE GREEN ASH.—(*Fraxianus viridis*, Michaux.)
CATALPA.—(*Catalpa speciosa*, Warder.)
SASSAFRAS.—(*Sassafras officinale*, Nees.)
WINGED ELM.—(*Ulmus alata*, Michaux.)
THE WHITE ELM—(*Ulmus Americana*, Linnæus.)

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(**Planera aquatica*, Gemelin.)
THE RED MULBERRY.—(*Morus rubra*, Linnæus.)
THE SYCAMORE.—(*Platanus occadentalis*, Linnæus.)
HICKORY.—(*Hickoria aquatica*, (Michx. f.) Britt.)
THE PECAN.—(*Hickoria pecan*, (Marsh,) Britt.)
BUTTERNUT OR WHITE WALNUT.—(*Juglans cinerea*, Linnæus.)
THE BLACK WALNUT.—(*Juglans nigra*, Linnæus.)
THE BLACK BIRCH.—(*Betula nigra*, Linnæus.

WHITE OAK—(*Querus alba*, Linn.)

The white oak is a beautiful tree and one which is most abundant all over eastern Arkansas, and on Crowley's Ridge where the underlying geologic formations are pleistocene. It is very abundantly distributed along the slopes of the ridge even in those portions where the soils are too siliceous for its great development. Immense quantities of this grand tree have here been cut down and destroyed. In many places the forests have been thrice cut over and the better classes of timber are now all gone. There are yet, however, vast quantities of the largest and finest timber remote from the railways, and east of the southern half of the ridge. The use most common for this timber in this area is for the manufacture of barrel staves and heads, there being many mills along the foot of the ridge engaged in this industry. At some places, as at Poplar Bluff, in Missouri, at Paragould, Harrisburg, and at numerous smaller places where there are mills, the annual output is very great. Car load after car load of staves, in the rough or partially finished, or "knocked down" after fitting, are to be seen in transit daily in all parts of the region. There is a most wanton destruction of valuable timber in this industry, which does not use all the tree, only a small portion of it being available. The remainder is left to rot, or is made into great piles and burned. No use is made of the ashes, which might be gathered and leached with profit.

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The bark, too, is a complete loss, notwithstanding that it is rich in tannin and might be utilized in the manufacture of leather, after having first been treated on the ground to extract this valuable product. Not only does the cupidity of men incite them to the felling of the largest and most perfect trees, but, in common with all suitable oaks of other species, many hundreds of thousands are annually cut into railway ties and shipped out of the state to regions less favored. The number of ties made and sold in Arkansas would seem incredible to one not familiar with the actual state of the industry. The product goes far to the west to the states with treeless plains, as Nebraska, Kansas, Colorado, to say nothing of the thousands utilized nearer home and at home in railway construction. The prices received by no means represent the actual value of this tree which is rapidly becoming a matter of history in this part of the state.

The barrel timber is used largely for wine and whisky casks, these liquids requiring a fine and close grained wood to retain the product. Many thousands of these barrels, in unfinished condition, or rather in "knock down" condition are sent to Europe where they are used for similar purposes. Petroleum, which likewise requires barrels of fine texture, is also shipped largely in casks made from this wood. Perhaps it is safe to say that the wood of the white oak is put to more common uses than that of any other forest tree in the United States. There is scarcely a branch of wood working industry which does not use it one way or another.

WATER OAK—(*Quercus aquatica*, Walter.)

The water oak is found associated with the willow oak (*Quercus phellos*) in considerable numbers in all Eastern Arkansas. It is very common in the slash regions of the Cache and L'Anguille, and does best on poor and wet soils.

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It does not attain a very great size, at least it did not seem to us to ever grow very large. It is used for posts and seems to be well adapted to that purpose.

THE OVERCUP OAK—(*Quercus lyrata*, Walter.)

This is one of the most abundant and largest oaks of the St. Francis bottoms, and is likewise one of the white oaks. It is commonly called the overcup oak, from the peculiar character of the cupules which hold the fruit. The acorn is nearly entirely covered. The wood is cut and marketed with white oak and is not often discriminated from it. Like the white oak it is largely employed in the manufacture of such barrels as need to be made from close textured wood.

THE MOSSY CUP OAK—(*Quercus macrocarpa*, Michaux.)

As implied in the name the acorns of this tree are very large and are further distinguished by a heavy and long fringe. To this tree therefore the common name of mossy cup oak has been popularly applied. It is very abundant and is of especial value for fencing purposes in this portion of Arkansas. This species resists the action of wet soils, or of water in soils better than any other American oak. It is therefore correspondingly valuable. It is very common and grows very large.

THE COW OAK—(*Quercus michauxii*, Nuttall.)

This species, called cow oak by the people, is a common form, growing to be a rival of the white oak in the bottoms of the St. Francis, where it attains its best development. It is a source of abundant mast for stock and is much sought by it. The acorns are large and sweet. While a close grained wood and largely used in barrel manufacture, it does not hold liquors as well as either the white oak or overcup oak, at least such is its reputation about the mills. Many, perhaps most of the barrels used for pork packing are made from the wood of the cow oak, a purpose for which it is admirably adapted.

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THE PIN OAK—(*Quercus palustris*, DuRoi.)

Possibly the pin oak is the most abundant oak of the slash country. From Wynne north along the base of Crowley's Ridge one is never out of its range. It is used chiefly for firewood and for railway ties, thousands of the middle sized trees being exported in the latter form.

Of other oaks not less than six or eight additional species might be distinguished. To the professional botanists, interested in questions of geographic distribution, abundance, crosses, variations, species, influence of habitat, and similar matters, this region offers a most inviting field. The prevailing features of the forests are contributed by the oaks and one is never, except in the heart of a cypress swamp, out of sight of a half a dozen forms at one time.

THE WILLOW OAK—(*Quercus phellos*, Linn.)

The willow oak is readily distinguished by the character of the foliage, the leaves closely resembling those of the willow. It is a very abundant tree in Arkansas, attaining its greatest development in the low and wet lands west of Crowley's Ridge. It is usually regarded as indicative of poor land.

THE BEECH—(*Fagus ferruginea*, Aiton.)

The beech is of erratic distribution along Crowley's Ridge, but does not appear to occur in any quantity in the lowlands to the west. It occurs abundantly from Helena to the Missouri line on both sides of the ridge, but most commonly along the slopes of its west face. On the top of the ridge none was noticed north of Jonesboro, though it is quite common south on the highest ridges. Scattering trees occur for the most part in and south of St. Francis county, while west and north of Gainesville and Jonesboro, in the Cache second bottoms, the species is most abundant and large. Many of the largest examples noted in the south of the ridge were either hollow or dry at the heart, which fact

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gives the trees certain peculiar features. It does not seem to be as common in the St. Francis bottoms or along the east side of the ridge as on the west, but no comparative notes were made on this subject. Except for firewood the tree appears to have no use in this part of the country.

The Pines.

There remain but two trees especially worthy of mention among the timber resources of this area, and they are both members of the great family Coniferæ, or cone bearing trees. The physicial conditions under which each thrives are of the most diverse kind.

The Cypress—(*Taxodium distichum*, Richard.)

The cypress is familiar to all who dwell in the eastern or southern portions of Arkansas. As is so well known the tree hrives in swamps and other wet and low lands; it often, as in the valley of the L'Anguille, stands in the very middle of the sluggish streams.

From its great utility the cypress is much sought after by the lumbermen. Its uses are very diverse, but it is especially adapted to the manufacture of shingles, into which article of commerce many thousands of feet are annually converted. There are several mills along Crowley's Ridge at Madison, Paragould and St. Francis, where shingles are made in great quantities. The power of resistance which this wood offers to the action of wet and damp stations, as in fence building, telegraph poles, electric light poles and similar uses has caused it to be in great demand. Many hundreds of the smaller sized trees are employed for poles.

The best trees that are accessible are now somewhat within the borders of the cypress swamps, the more easily reached having, as a rule, already been marketed. The nature of the places best suited to the growth of the cypress renders difficult its cutting so that its price is slowly but steadily advancing. "The most valuable timber has own,

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however, disappeared from the immediate neighborhood of the low river banks easily accessible at seasons of high water during every winter and spring. Only groves standing remote from the banks of the water courses, and which are only accessible to the raftsman during exceptionally high stages of water, now supply this lumber. The shallow lagoons, covered with water except during seasons of prolonged drouth, and called cypress creeks, present in the spring of the year a strange sight. No object meets the eye between the immense trunks of the mighty trees, as in these cypress groves no other tree or shrub can live in the dark shaded, water covered soil. These reservoirs of drainage, generally without an outlet, are called cypress lakes if the water in any part of them, too deep to allow the growth of trees, confines the cypress to their more shallow borders. Here the cypress arrives at its greatest dimensions and produces timber of the finest quality." This statement, originally applied to the cypress swamps of the Yazoo region in Mississippi, is true to a very great extent of the cypress regions of the St. Francis and White rivers. Perhaps the great body of cypress in northeastern Arkansas is still standing in the valley of the White river, but even here the most accessible have been removed. From the top of Crowley's Ridge, looking either to the east or west, at those points which command the valleys of the St. Francis and the Cache, the cypress areas can be readily made out by the observer. The tops of the giant trees tower far above the heads of the intervening forests and give one the location of the swamps for hundreds of square miles. It is evident to a person thus situated that immense quantities of this tree still exist in Arkansas, and that this region will yet supply vast quantities of valuable cypress timber. Into the depths of the greater swamps the lumberman has not yet penetrated.

THE SHORT LEAVED PINE—(*Pinus mitis*, Michaux.)

This is the short leaved pine of authors and is practically

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the only species growing within the state north of the Arkansas river. Its distribution has not been carefully studied in the areas outside of Crowley's Ridge on which its occurrence was carefully noted. Its distribution is somewhat erratic, but after all, is readidly seen to conform to certain physical conditions imposed by the character of the soils. It rarely decends to the base of the ridge and only then in straggling representatives. The lowest trees noticed, small ones at that, were about two miles north of Wittsburg in Cross county, where a few saplings were found near the road not far from Coppers creek. The highest points in the ridge in Cross county where the soil is siliceous or sandy have a growth of pine, none of which is very large. The presence of numerous large pine stumps, however, tells the story of this tree in language that cannot be misunderstood. Near Harrisburg, Vanndale, and Jonesboro are to be found, on the tops of the highest hills, stretching away in long straggling lines, what now remains of the pine forests of this portion of the ridge. But in Greene and Clay counties, and on some of the more elevated hills of Craighead county, there is still standing many fair sized pine trees. The largest and best have, however, been cut off, the region having been twice cut over. Farther from the railways there is still considerable pine standing, much of it large and fine. A typical locality is about Hardy's mill not far from Gainsville. Here, on the high hills that are composed of the tertiary sands and gravels, there are still many large pines. But their entire removal is the question only of a short time.

Of the pine reported for the Crowley's Ridge region by the agents of the tenth census, which estimate was made for 1880, comparatively little now remains. That census gave the following figures, which may not be wholly devoid of interest in this connection:

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COUNTIES.	FEET BOARD MEASURE
Phillips	21,000,000
Lee	14,000,000
St. Francis	7,000,000
Cross	54,000,000
Poinsett	45,000,000
Craighead	18,000,000
Greene	38,000,000
Clay	3,000,000

It is safe to say that not one-tenth of this timber is standing at the present time. The great pine producing areas south of the Arkansas river form, at the present time, the object of attention from the lumber manufacturer, so that it is possible that the pine producing areas in our section may have time for recuperation, since pine replaces pine in this region.

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VALUE OF ARKANSAS FORESTS.

NAMES.	STATION.	CAPACITY PER DAY.
Big Creek Lumber Co.	Grace Ark.	20,000 feet
J. I. Porter & Co	Tyrone	30,000 feet
Frank Kendall	Kedron	40.000 feet
Bluff City Lumber Co	Anderson	15,000 feet
H. C. Draughon & Co	Kingsland	35,000 feet
Bear State Lumber Co	Kingsland	30,000 feet
Dorchester	Kingsland	20,000 feet
Saline Lumber Co	Kingsland	20,000 feet
Moro Lumber Co	Kingsland	20,000 feet
Southern Land & Lumber Co	Dry Run	75,000 feet
Acrum & Son	Fordyce	20,000 feet
Fordyce Lumber Co	Fordyce	50,000 feet
Caney Lumber Co	Thornton	20,000 feet
W. R. Pearson	Thornton	45,000 feet
R. Buchanan	Thornton	30,000 feet
Little Bay Lumber Co	Little Bay	40,000 feet
Eureka Lumber Co	Harlow	40,000 feet
Cotton Belt Lumber Co.	Bearden	45,000 feet
Justice Lumber Co	Bearden	20,000 feet
Freeman Lumber Co	Millville	60,000 feet
Eagle Lumber Co	Eagle Mills	75,000 feet
C. E. Linedecker	Lilley	20,000 feet
Johnson Lumber Co	Van Duser	25,000 feet
Farmer	Buena Vista	20,000 feet
J. E. Potts Lumber Co	Evans	75,000 feet
Keystone Mills	Evans	40,000 feet
J. W. Harrington	Stephens	10,000 feet
American Lumber Co	Milner	40,000 feet
Cotton Belt Mill Co	Cotton Belt	40,000 feet
Magnolia Lumber Co.	Magnolia	30,000 feet
A. J. Neimeyer Lumber Co	Waldo	50,000 feet
W. M. Johnson	Waldo	20,000 feet
J. M. & V. M. Davis	Waldo	25,000 feet
W. T. Davis & Co	Buckner	25,000 feet
Baker & Strange	Buckner	15,000 feet
Bodcaw Lumber Co	Stamps	130,000 ft.
Sunny South Lumber Co	New Lewisville	50,000 feet
Interstate Lumber Co	New Lewisville	30.000 feet
Red R ver Lumber Co	New Lewisville	50 000 feet

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VALUE OF ARKANSAS FORESTS.—*Continued.*

NAMES.	STATION.	CAPACITY PER DAY.
Moore & Wells	Motts	30,000 feet
Cameron Lumber Co	Cameron Mills	30,000 feet
E. W. Frost & Co	Genoa	40,000 feet
Wm Armstrong	Genoa	25,000 feet
Gate City Lumber Co	Texarkana	50,000 feet
Martin Lumber Co	Bolinger	30,000 feet

HISTORY OF THE ARKANSAS LUMBER INDUSTRY.

BY MESSRS. R. W. HUIE AND FRANK R. PIERCE.

A bird's-eye view of the state of Arkansas (a state larger than England, New York or Virginia, and when settled as thickly as Massachusetts, will have a population of 12,000,000) would present to the vison of the beholder, in mountains, rivers, wooded valleys, uplands and lowlands, a wonderful kaleidoscopic panorama—a variegated, picturesque and extraordinary landscape. The presence and prominence of the ranges of mountains traversing its territory in different sections would at once accentuate the densely timbered primeval forests which these embosom, while its great wealth of rivers presenting 3,250 miles of navigable waters, which wind their eternal serpentine courses, like so many vast ribbons of burnished silver, along or through nature's own forestry, would form a beautiful scene of reflected brightness for the expansive shading of growing vegetation that altogether would constitute a composite picture, which, to the true lumberman's heart, could scarcely fail of suggesting a veritable "Garden of the Gods"—if I may be pardoned for becoming somewhat rhapsodical on the subject of the state's timber resources, which of course constitute the entire foundation for the vast possibilities of the future lumber business of the state, as well as the past and present. Such

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a survey would disclose the fact that not a bald and barren region of rolling prairie constituted the one striking characteristic of the state, but that a bounteous timber supply, if the farm lands be excepted, would be the main feature in its contour and personnel.

From "King's Hand Book of the United States"—just out, and the very latest published authority on the subjects upon which it treats—on page 65, I quote: "There are about 30,000 square miles of timber lands in Arkansas, the most abundant being the yellow pine." There are 15,000 sqaure miles of pine land. The cypress is found in the swamps of the east and south. Different species of oaks abound, the white oak being the most valuable. Yellow poplar occurs in the east and cedar is abundant in the northern mountains. Other valuable woods are walnut, cherry, sweetgum, hickory, beech, maple, elm and ash, persimmon, pecan, catalpa, sycamore, buckeye, dogwood and locust. "From these forests," continues this authority, "$20,000,000 worth of lumber is cut yearly, large shipments being made to Europe." Again, on page 68, appears the following quotation from Ex-Governor S. P. Hughes, and at present an associate Justice of the Arkansas Supreme Court, viz: "We know that Arkansas abounds in all the material elements of wealth and greatness; that she has over 2,000,000 acres of state lands to be donated to actual settlers, and that there are within her borders 5,000,000 acres of public lands of the United States subject to homestead entry, to be had in 160 acre tracts at a cost of not over $20 per tract. We are rich in timber, having 30,000 square miles of grand forests of the most valuable varieties; rich in minerals, having over 12,000 square miles in coal fields, an abundance of iron, manganese, zinc, copper, marble, granite, limestone, litho graph and soapstone." Since Governor Hughes made this statement, immense deposits of valuable aluminum clay have been found in the state. Excepting the prairie lands and lands in cultivation, the whole state is heavily timbered.

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So much for the timber resources and possibilities of the great and rapidly developing state of Arkansas.

Now, as to a history in brief, and a resume of the lumber manufacturing industries of the state. Quoting once more from the volume to which I have previously referred, I take from page 68, the following extract: "The manufactures of Arkansas are small compared with the quantity of raw material found within her borders." Her coal, lumber, clay, marble, chalk, building stone, whetstone, manganese and cotton, will undoubtedly cause the manufacturing interests to increase in the future. In 1880 there were in Arkansas 1,202 manufacturing establishmenis, employing about 5,000 hands and a capital of $3,000,000. In 1887 the number of factories had increased to 2,400, employing 16,000 hands and capitalized at $58,000,000. Flour and lumber mills employ the great bulk of this investment." Later on I shall present more in detail, larger and more comprehensive statistics, compiled from absolutely authentic sources, which show the present status and magnitude of the Arkansas lumber business, but for the present shall sketch briefly the birth and advent of the industry here. From the best authenticated information obtainable from living witnesses, in this the southwestern part of the state, I conclude that the circular saw made its advent in this section not earlier than the 50s. Previous to that time the custom as to the manufacture of useful lumber, was to saw it from the rough logs by means of what was then called a "whip saw," a slab of notched iron, more cumbersome but not altogether unlike the familiar "crosscut saw" of the present. The only purposes for which manufactured lumber was used in the earlier days of the settlement of this state were those of flooring and constructing door and window shutters, when the boards were never dressed. The sawmill personnel then consisted of a hewn log, squared with the broadax, usually to about a foot

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square; this was laid horizontally on a platform or trestle seven feet above the ground and a straight mark having been made on the stock thus prepared with a line and some sort of colored liquid, for the guidance of the upper sawyer, one stout and brawny lumberman mounted the log and pulled the "whip saw" up from below and another sawyer underneath pulled the saw down from above through the log, and thus the two would produce possibly one or two hundred feet of lumlumber per day. This may seem a primitive method of producing boards, but such was the state of affairs in southwest Arkansas within the memories of very many old settlers yet living, and by no means in their dotage. Indeed, I have in mind as I write this, a building yet standing and occupied as a residence, in Arkadelphia, Clark county, constructed in 1836, a material part of the original lumber with which it was built and is yet good, was sawed in this way, and one of the men who helped saw it thus is still living. This method constituted for a long while the principal, if not the only way of producing lumber, all over the state, the exception of water or other power being used, having been rare. With the great abundance of water power existing everywhere so conveniently, it was but a natural step upward in the evolution of the lumber business, to apply water-power to the driving of the "sash saw," a saw still like the crosscut, which worked in a frame and made its upward and downward strokes with accelerated speed and power so effectively as that a much better grade of lumber and a much larger quantity, ranging at from one to four thousand feet per day, was produced. This "sash saw" was undoubtedly the progenitor, probably the grandfather of the "gang saw" of to-day. It represented the "monkey stage" of the "gang saw's" evolution. The final appearance of the circular saw announced the awaking of a slumbering giant, destined by its activity and magnificent prowess to cause a buzz in the orest wilds of the state, that like the ominous booming o

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the long muzzled cannon, known of history, was "heard all around the world;" and yet the use of the circular saw did not so rapidly augment, in volume, the lumber iudustry, as such an event seemingly should have done, when the superb conditions for its growth were so auspiciously at hand in every locality; previous to the advent of the great trunk railways which now traverse this state from different points of the compass, binding her in close embrace to her sister commonwealths, the sawmill industry, save in exceptional localities, did not assume anything at all like great proportions; the great majority of all mills then existing were those of small capacities, and their fixtures, machinery and accessories were mechanical simplicities, and unweildly and puerile seeming paraphernalia now. Even as late as in the 70s, in places where millions of feet are now cut per day, a production of 5,000 or 6,000 feet was rather a remarkable average daily output, while an output of 10,000 feet of lumber in a day would have been an extraordinary product. In the absence of railway transportation facilities, such mills had only to supply the local demand, embracing an area of perhaps 15 or 20 miles of contiguous territory; then, lumber beinghauled only along the ordinary dirt roads, in road wagons, drawn by mules, horses or oxen, was sold by the hundred feet, and a lumber bill for one purchaser footing up into the thousands of feet was indeed a "fat take," which to be sure came singly and never in whole battalions, so to speak; nor was the taste so exacting then as it now is. The lumber business had not then become that precise science which experience and education with its lines has throughout the state made it now to be. Then the quality of the product was not so critically considered, and classifications and graduations such as now obtain everywhere, had no existence in the main portions of the state. Lumber then like whisky, was all good, some however, being better than other. "Culls" were not then so much thought or spoken of; were not so

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aggressively large in bulk then, as now this aggravating rubbish is wont to become. But if the output was smal , and the average quality was not of a high grade, the prices commanded by it were truly compensating—then it was worth $20 to $30 per 1,000 feet at the mill, as compared with $14 per 1,000 feet of "first" at the mill now. But the construction in 1873 of the St. Louis, Iron Mountain & Southern railway from the Missouri state line across the entire state of Arkansas, having rendered possible the safe and rapid transportation to any of the open markets of the United States in particular, and with the outside world at large in general, of lumber as of any other valuable and indispensible commodity, a new impulse all along the lines of that railway and its branches was given to the production of lumber in this state, and this also might be said of the completion later on of the "Cotton Belt" road, and of course applies to the construction of the Fort Smith railway.

In addition to this lumber product, there is also turned out annually, in this state, the following closely related forest products: Cedar posts and piling, 1,600,000 pieces; hickory, 1,000,000 feet; cypress shingles, 3,000,co 000; fellos and staves, 1,500,000,000; poplar, 8,500,000; ash, 20,000,000; spokes, 2,000,000—the value of these swells the total value of the state's forest products to not less than $20,000,000.

A history of the lumber industry of Arkansas would not be complete without reference to Capt. R. W. Huie. Mr. Huie is a native of Arkansas, was born in Waldron, Scott county, in the year 1845, received an ordinary country school education, served an apprenticeship as a tanner, volunteered his services to the Confederacy at the age of seventeen and served his country in the capacity of a soldier for a term of three years.

After the war he engaged in mercantile pursuits, which claimed his entire attention up to 1886, at which time, in

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connection with others, he organized the U. T. A. & M. Ry. company, and the Arkadelphia Lumber company, which companies he now represents in the capacity of general manager In the year 1889, in connection with C. E. Neely and Dr. J. R. Dale he organized the Citizens Bank and was elected president, which position he still occupies.

He claims that his reason for being a lumberman is that he was born in a house constructed of yellow pine logs, floored, ceiled and covered with yellow pine boards, and rocked in a yellow pine cradle, in the yellow pine forests of Arkansas.

FRUIT GROWING.

"It is too late in the day for any to dispute the proud pre-eminence of Arkansas as a fruit country. She wears at her girdle every pomological scalp in sight, to-wit: First prize for best apple in competition with 22,000 plates. First prize at World's fair, New Orleans, 1885, for best collection. "Wilder medal" for best seedling apple, the first prize at Riverside, California. First award, World's Fair, Chicago, 1893. The horticultural world is at our feet and we are gently sighing for some one to tread on Pomona's skirt. The following list usually appears at our exhibitions, supplemented by eighty-eight seedling varieties: Early Harvest, Maiden Blush, Red Astrachan, Summer Queen, Alexander, Tetofsky, Early Joe, Early Strawberry, Early Red Margaret, Transcendent, Horse Yellow May, Missouri Pippin, Yellow Transparent, Lady Finger, Rambo, Red June, Sweet Bough, Fall Queen, Oxhart, Wagner, Mammoth Pippin, Michael Henry, Shannon, Wine Sap, Northern Spy, Ben Davis, Hubbardson, Newton Pippin (green), Newton Pippin (yellow), McAfee, Pryor's Red, Jeniten Red, Winter, Sweet, Shockley, Ingram, Rhode Island, Greening, Rome Beauty, Baskin's Red, Esopus Spitzbergen, Royal Red, Willow Twig, American Golden Russett, Roxbury Russett, English Russett, Arkansas Beauty, Gilpin Lawror, White Pippin, Nickajack, Smith

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Cider, Roman Stem, Autumn Strawberry, Grimes' Golden, Hall's Seedling, Huntsman Favorite, Arkansas Black, Baldwin, Worthen, Kentucky Streak, Vendevere, Shocklow, Hatcher, White Winter, Fearmain, Yellow Bellflower, Gloria Mundi, Capp's Mammoth, Pound Pippin, Twenty Ounce, Fall Pippin, Schale's Seedling, Gill's Beauty, Croffelt's Red, Western Beauty, St. Lawrence, Lady Sweet, Tallman Sweet, Large Red Crab, Transcendent Crab, Virginia Greening, Pennock, Buncombe, Fallwater, Golden Pippin, Buff, Fisher, Red Winter, Taunton, Seek-no-further, Renish, May, Western Beauty, Coffet's Red Star, Mammoth Sweet, Golden Winter, Tune, Brightwater, Stephenson, Golden, Elkhorn, Bently, Peck's Pleasant, Wilson Pippin, Russell's Red Streak, Paschal, Buckingham, Philadelphia, Graft, McClellan, Black Detroit, Wade's Swaar, McCaleb Tullahee, Pennsylvania Cider, Cole's Bedstreak, Crawford Pippin, King Tomkins County, Porter, Reed's Sweet, Clark's Bed, Cole's Pearmain, Blue Pearmain, Kendrick's Golden, Green Stripe, Nugent's Pippin, Jonathan, Sweet Rambo, Clark's Stripe, Domine, Newton Spitzbergen, Jersey Red, Fisher Seedling and Babcock.

Pears.—Outside of Washington territory we concede no superiority, and here only in a few varieties, most successful are Bartlett, Tyson, Beurre d'Anjou, Vicar of Wakefield, Onondago, Duchess, d'Angouleme, Osband's Summer, Lawrence, Bennie Clairgau, Jefferson, LeConte, Flemish Beauty, Clapp's Favorite, Howell, Buffman, Bloodgood, Doycnne d'Ete, Beurre, Easter, Sekel d'Aremberg, Early Harvest, Keiffer.

Peaches.—In the mountain protected sections there has not been an absolute failure in thirty-five years. The favorite varieties are Arkansas Traveler, Wilder, Piquet's Late, Emelia, Elberta, Stump the World, Early Tillotson, Gray's Held On, Early Rivers, Salway, Porter, Mixon Cling, Beer's Smock, Brigg's May, F. St. John, Thurber, Nix's Late, Al-

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exander, Columbia. Wheatland, Ringold, Chinese Cling, Harris' Early, Amsden, Mixon Free, Blood Cling, Lady Ingold, Gen Lee, Susquehannah, Crawford's Early, Crawford's Late, Lemon Cling, Heath Cling, Shumaker.

Grapes.—Arkansas is the home of the grape and where tame varieties are planted the wild ones must be grubbed up. All the newer varieties are cultivated with more or less success. The favorite varieties are Ives' Seedling, Champion, Lenoir, Concord, Martha, Herbmont, Black July, Elvira, Delaware, Louisiana, Cunningham, Hermann, Norton's Virginia, Cynthiana, Lady, Neosho, Prentiss.

A bottle of Arkansas red wine took the prize at Vienna in competition with the most prominent vintages of Europe.

Ives' seedling, Norton's Virginia, Champion, Cynthianna and Delaware have never known disease in our state."

AGRICULTURE AND HORTICULTURE.

Arkansas is most fortunately located for growing a great variety of agricultural and horticultural products. The varying altitude of the state gives us, practically, ten degrees of latitude. Our altitude runs from 125 feet above sea level to 2823 feet. About one-half of the state is less than 500 feet above sea level; one-fourth is from 500 to 1000 feet; and one-fourth from 1000 to 2123 feet above sea level. Our mountain section abounds in comparatively level plateaux, varying in width from one to twenty miles, of very productive soil, specially adapted to small grain, tame grasses and fruits, the winter apple being the leader. This mountain section is bountifully supplied with the best hard woods, such as walnut, cherry, maple, oak, etc. It is also exceedingly well watered.

This varying altitude enables the state to grow successfully and profitably all the field products grown between the lakes on the north, and the Gulf of Mexico on the south. Rich sugar cane, potatoes, cotton, castor bean, corn,

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oats, etc., grow excellently in the southern and eastern parts of the state. In the north and northwestern part wheat, Irish potatoes, oats, corn, clover, bluegrass, timothy, (in fact all the grasses) and the apple grows to perfection. Small berries do equally well in all sections of the state; about the only difference being that when grown on the low lands they mature from two to three weeks earlier.

Our principal field crops are corn, cotton, wheat, oats, rye, hay, potatoes, field peas, sorghum, sugar cane, rice, broom-corn, millet, apples, peaches, pears, plums, strawberries, raspberries, blackberries, melons, etc. The state is also well adapted to gardening for market. Stock raising and the dairy industry occupy prominent places among our industries.

Area of the state	33,518,890 acres
Arable land	28,490,980 acres
Land in cultivation	10,240,000 acres
Timber land	18,000,000 acres
Prairie land	2,197,032 acres
Alluvial land	10,000,000 acres
Public land, U. S	4,687,573 acres
Public land, State	1,000,000 acres
Coal land	4,650,000 acres
Railroad land	2,000,000 acres
Land containing ores of iron, manganese, zinc, copper, bauxite, antimony, galena, silver	7,124,000 acres
Land containing ochre, clays, kaolin, gypsum, marble, granite, onyx and slate.	3,150,000 acres
Land adapted to fruit growing	25,000,000 acres
Land specially adapted to growing apples, pears, peaches, grapes and berries	19,000,000 acres
Land containing sandstone, limestone, lithographic stone and novaculite	12,000,000 acres
Navigable rivers	3,000 miles
Railways in operation in 1894	2,243.9 miles

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ARKANSAS OCHRES.

Of the collection made in south Arkansas for the World's Fair, nothing appeared to give visitors greater satisfaction than the clays and ochres found in that part of the state. The original collection of clays has been added to, during the present year, and, at this time, forms an exhibit calculated to interest clay prospectors and manufacturers in search of such material.

The ochres are from Monticello, in Drew county; where, commencing six miles north and ending twelve miles south from the town, beds of the pigment are found wherever the area of greatest surface elevation has been worn, by erosion, to the water level. The occurence of the ochre is not without limitation, but is confined to a system of quartionary gravels and sands forming the ridge pole of the Bayou Bartholomeu and Saline water sheds; and technically is an occurrence that is accounted for in the action of iron pyrites in the gravel and sand upon the kaolins of the underlying formation of the country.

There are two varieties of the ochre, both of which are pronounced superior to American ochres of commerce. The largest body in sight is found one mile south from Monticello. It has been named "Rough and Ready" ochre, the term having been derived from an old town site near by. Another body, said to be less in quantity, but which has not been explored, is named, typically, "Montongo" ochre, the term having been taken from a postal villiage, near which it is found.

Of the the two types named, experts pronounce the first equal to imported ochres. But in their determination of the Montongo, they go farther, and contend that it is superior to other earthy pigments known to the arts; and on account of its quality and color insist that samples of the material be offered for trial to continental manufacturers of water colors, who would pay a higher price for it than it is likely to command on this side of the Atlantic.

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The Montongo ochre is remarkable for its oxidation when the water of crystallization is driven off by heat, the resulting product being a bright "wagon" red pigment. It is also remarkable for the quality of assimilating with other pigments and colors, the base of which is either iron or organic matter. This last quality has been satisfactorily tested, both in a powdered state and as a paint; and as a result of adding a few simple elements to the native and roasted ochres forty to fifty colors and shades of pigments have been obtained suited to decorative painting and pottery.

Other discoveries of ochre have been announced in south Arkansas and other parts of the state, but of which no authentic report has been received at this office. The presence of ochre in the state in quantity is indisputable. The difference made in favor of the "Rough and Ready" and "Montongo" ochres as against other discoveries, is the extent of the material, and understanding of which was arrived at before the presence of the ochre was made known to this office.

SOUTH ARKANSAS CLAYS.

According to the best information upon the subject, "local modification" plays so important a part in the character of the south Arkansas clays that a thousand specimens would exhaust neither the color nor variety of plastic material it is possible to collect in the combined territory of Jefferson, Cleveland, Drew, Ashley, Bradley, Calhoun, Dallas, Ouachita, Union, Columbia, Lafayette and Miller counties.

The collection received at this office comprises clays found in Drew, Ashley, Bradley and Columbia counties. It has been limited to four counties, because a prospect is now in progress by parties in interest, who are preparing several hundred samples for the Atlanta exposition. The specimens will be arranged to eclipse all displays of the kind made in the United States, and as it is evident that none of

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the territory in mind is to be overlooked, and the arrangement left in the hands of those skilled in the examination of such material, it is thererore only a question of a few months when the other counties named will be represented equally as creditably as Ashley, Drew, Bradley and Columbia.

ALUMINUM CLAY.

The type of clay obtained from Ashley county is an original or modified form of bauxite, which the discoverer has named "Rootsite," in honor of the late Col. Logan H. Roots of Little Rock. It is almost of soluble form, and is found in so great body near Hamburg that, upon a prospect made of the locality, it was seen to afford a good reason for railroad building through the county; and, to that end, has been examined and tested more thoroughly and with better results than any material found in the state.

The discovery which was made last year has not been permitted to create excitement among property owners, which is to their credit. They have been left to understand the cost of extracting aluminum from clays, and prefer to have their county prosper by means of aluminum plants and railroads, which the material invites, than to prosper by a policy of extortion and obstruction thrown in the path of capitalists who have means to invest in our southwestern country.

BRADLEY COUNTY CLAYS.

The samples received from Bradley county consist of shales and clays, so called, both of which evidently belong to the lignite formation of that county. The shale is found in several parts of the county; and at Warren, the county town, it crops out near the surface, one-fourth of a mile from the public square. The shales of Bradley county constitute the principal body of material discovered in south Arkansas, suited to the manufacture of sewer pipe.

All of the clays found in the county are also represented in the vicinity of Warren, no less than five or six being near

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town and the others within three miles of its boundaries.

It comprises, principally, terra cotta, drain tile, pressed brick and vitrified brick clays.

Among the varieties of pressed brick clays are two known to J. N. Wheeler of Warren, who supplied the collection, which, according to the samples, should be brought to the notice of brick manufacturers.

TESSELLATING TILE CLAY.

While distinguished for its beds of commercial ochres, due in part to the same causes from which it derives its character, Monticello, in Drew county, also supplies handsome specimens of tesselating tile clay. It is, in fact, in some respects, an arrested ochre; but, upon the whole, parts company with the ochre when it is subjected to heat, the iron stains evaporating, and the material seen to be that of which, according to types, tessellated tile and majolica ware is made.

The localities of the tile clay, it seems have their characteristic equally as the ochre, and is perhaps to have, from manufacturers, as much attention as the ochre. Away from the ochre and tile clay, the country is one which, to a great depth shows an impure kaolin, so-called, but which is, no doubt, a fire clay; and, at intervals, over the county, appears near the surface, in forms suited to the manufacture of highly vitrified wares of all kinds.

COLUMBIA COUNTY CLAY.

The specimens received from Columbia county are not only remarkable for variety and number, but, at a glance, they are seen to be the best of their types found in the state. The collection, to the number of fifty-three specimens has come to this office, labelled "Cotton Belt" clay, growing out of which name, it was subsequently learned that a thorough clay prospect was being made of the Cotton Belt railway territory of this state, the object of which was a display at the Atlanta Exposition.

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The collection consists of both native and manipulated clays, the last named being the result of experiments made under the direction of those who manufacture majolica ware and tessellating tile, and without the secret of these vessels in the art, it were well nigh impossible to duplicate the colored clays.

Of the native clays those adapted to pressed brick are found mainly at Waldo in that county. At Magnolia, and in its vicinity, the types run exclusively to tessellating tile and pressed brick clay, with last named variety continued at intervals to McNeill, situated six miles north. And at Buckner, on the Cotton Belt road, or commencing one mile north and extending indefinitely northward, the specimens show the presence of fire clay, terra cotta, and pressed brick clays.

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FALSE IMPRESSIONS OF THE SOUTH.

[Extract from a Speech by Gov. Fishback.]

"When we speak to a northern audience of 'the south,' although a part of their common country, and, strange as it may appear, we speak of a *terra incognita.* Indeed, this is scracely an accurate definition, for 'the south' is not only not known in the north, but it is falsely known.

One of the most extensive and fundamental errors in the northern estimation of the south, is that its climate is both unhealthy and so enervating that it forbids industrial activity.

Nothing could possibly be further from the truth. The first error is attributable to the fact that our low, bottom, fertile lands of the southern states were first settled. Such districts as these furnished the first vital statistics, and have at all times served to bring up the average, even after the healthy hill districts were settled.

VITAL STATISTICS.

The census reports, just published, taken by a man whom nobody will accuse of partiality to the south, show that in 1890 the average death rate of the United States was 13.98 per thousand. The average of the northern states, including Missouri, Maryland and West Virginia and the District of Columbia, excluding territories, was 14.67, while that of the twelve southern states, including Kentucky, was only 12.70.

How many people north of Mason & Dixon's line know this? Yet the facts are at the command of every man who will examine the census reports.

The second error has been manufactured for selfish purposes, and in the face of well authenticated and easily accessible facts.

Permit me to present a few facts taken by the Manufacturers' Record from the census reports, and from two periods, the decades from 1850 to 1860 and from 1880 to 1890, leav-

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ing out the intervening period, when the whole country was engaged in destroying industrial activity, as well as property, in 'the south":

BEFORE WAR AND RECONSTRUCTION.

First—In 1850 the south had 2,335 miles of railroad, while the New England and middle states had 4,797 miles, or more than twice as much as the south. Ten years afterward, in 1860, the south had 387 miles more than the New England and middle states combined. The south increased to 9,897 miles, or 319 per cent.; the New England and middle states to 9,510 miles, or only 100 per cent. Yet the population in the north during this decade increased 42 per cent, while that of the south increased only 24 per cent, including slaves.

Second—In 1850 the south ground $24,773,000 worth of flour; ten years after, in 1860, $45,006,000, a much larger per centage of increase than the rest of the country.

Third—In 1860 the south sawed and planed $10,000,000 worth of lumber more than in 1850. This was upwards of one-third of the gain of the entire country, although it had less than one-third of the population, even including slaves.

Fourth—In 1850 the south had in iron foundries $2,300,000. In 1860 this had increased to $4,100,000, a larger per centage of increase than the balance of the country.

Fifth—From 1850 to 1860 the south gained in the manufacture of steam engines and machinery 200 per cent, while in the balance of the country it was only 40 per cent. The south gaining $4,200,000, the balance of the country gaining $15,000,000.

Sixth—Although the south had in 1860 less than one-fourth of the white population of the union, and only one-third, including slaves, and although the cash value of the farms of the south was but little over one-half that of the balance of the country, yet the south produced more than

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half the agricultural products of the entire country, the excess being $377,417,604. The north, with $4,330,004,869 invested in farms, produced in 1860 $1.511,426,598, while the south, with only $2,308,409 352 invested in farms, yielded $1,888,844,202 in products. Leaving out her rice, cotton and sugar crops, which amounted to $494,196,000, the south nearly equaled all the balance of the country in grain, meat and other products which the north claims as peculiarly their own.

Seventh—In 1860 the balance of the country had in home-made manufactures $7,672,941, while the south had $16,585,281, or more than twice as much.

Eighth—From 1850 to 1860 the New England and Middle States combined increased in wealth $2,460,000,000, while the south increased $3,480,000,000 or upwards of a thousand millions more.

In 1850 the New England and Middle States had two hundred and sixty millions more than the south. In 1860 the south had seven hundred and fifty millions more than they.

Such was the proud, triumphant march of the south when she was smitten with the blight of

WAR AND RECONSTRUCTION.

In 1860 the south, although having less than one-fourth of the white population, had nearly one half, or 44 per cent., of the wealth of the entire United States. After ten years of war and misrule, in 1870, the single state of Massachusetts owned more than half as much wealth as the entire south. Massachusetts had more than doubled her wealth, while the south had lost nearly half of hers.

In 1860 the south had $750,000,000 more of wealth than the New England and Middle States, but in 1870 the northern section had $10,800,000,000 more than the south.

It was not until 1880 that the devastation of war and reconstruction had spent their forces, and the south was put

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upon her feet again. Then again she bounded forward, and is coming to the front with a speed that foretells triumph.

AFTER THE WAR.

Let the census tell the startling story. Starting thus far behind in the race, with all the power and influence of the combined wealth of the New England and Middle States exerted to push the west forward at the expense of the south, this wonderful section: *First*, had built in ten years, from 1880 to 1890, 25,000 miles of railroad at a cost of $900,000,000.

Second. From 1880 to 1890 the New England and Middle States increased in wealth $3,900,000,000, while the south increased $3,800,000,000. The south gained 50 per cent, the northern section only 22 per cent.

Third. All the balance of the United States gained in farm assets from 1880 to 1890, 30 per cent while the south gained 37 per cent.

Fourth. The south gained from 1880 to 1890 in value of farm products $107,000,000, while all the balance of the country gained $141,000,000. The south had scarcely one-fourth the capital invested in farming, yet produced nearly half the products; the investment in farm assets in the south yielding 24.1 per cent, while that of the balance of the country yielded only 13.1 per cent, or a little over one-half.

Fifth. Ten years ago the agricultural products of the south exceeded her manufactured products by $200,000,000; now her manufactured products are $140,000,000 in excess, and if we include mining their excess is nearly $200,000,000.

Sixth. In 1880 the south had invested in manufacturing $257,244,561; in 1890 she had $659,008,817, a gain of 156 per cent against a gain of only 120.76 per cent in the balance of the country.

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In 1880 the value of the manufactured products of th south was $457,454,777—in 1890 it was $917,589,045, a gain of 100 per cent, against a gain of less than 70 per cent in the balance of the country.

The factory hands in the south received in 1880 only $75,917,471; in 1890 they received $222,118,505, a gain of nearly 200 per cent.

In 1880 the south had invested in cotton mills $21,716,-713; in 1890 she had $61,124,096, and now it is estimated at $97,000,000.

In 1880 the south produced 397,301 tons of pig iron; in 1893 her production was 1,567,000 tons, or nearly 300 per cent increase.

In 1880 the coal out-put of the south was 6,048,000 tons; in 1893 it was 28,000,000 tons, or over 300 per cent.

These facts render the alternative conclusion unavoidable. Either we have the most wonderful people in the world, or the most wonderful country.

Permit me to tell you something more in detail of one portion of that wonderful country, knowns as

ARKANSAS.

Which is richer in resources than any other equal area on the continent.

1st. Arkansas has 216 square miles of zinc, which has recently taken the premium at the World's fair as the best in the world, and it is more easily mined than any other yet discovered.

2nd. All around the zinc are 2,199 square miles of marble of the same quality as the Tennessee marbles—the pink and black marbles being superior to any known.

3d. She has 2,347 square miles of coals, which for some purposes are superior to most coals. Ten years ago we mined 5,000 tons; now we mine 750,000 tons.

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4th. She has extensive antimony deposits in the vicinity of these marl and gypsum deposits.

5th. She has the only chalk bluff in the United States which will make Portland cement, and the gentleman who started the first Portland cement factory in Europe pronounces ours the best in the world.

6th. She has the only other bauxite deposit (there being but two) yet discovered in the United States.

7th. She has extensive deposits of kaolin, and about thirteen counties underlaid with clays, rich in aluminum, and many adapted to all the purposes of the ceramic art, as also to making fire brick.

8th. She has three deposits of manganese, each in immense quantities and of excellent quality. Its area is 126 square miles.

9th. She has several slate deposits, one recently discovered bluff being equal to any this side of Scotland, and of three colors, black, blue and red.

10. She has a recently discovered ledge of mica.

11. She has magnetic, and other iron ores scattered throughout the mountain region of the state and the most extensive novaculite deposits in the United States, or 305 square miles of it, and of such auperior quality that they are sought for all over the world.

12. She has valuable granite, blue and grey, and flag and other building stone in enormous quantities scattered over the greater part of the state, besides 7,000 square miles of limestone.

13. She has natural gas and coal oil, but not yet developed.

14. She has enough shale out of which vitrified brick are made, to pave every city in the United States. She is paving several. Its quality is unexcelled.

15. She has water power enough to manufacture all the cotton in the world, and nearly four thousand miles of navi-

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gable waters, which with proper attention by our national government could be made navigable the year round.

16. She has timber which, as estimated by those who know, if cut and sold would purchase every acre of land in Kansas and Nebraska at their assessed values.

17. When you have cut cff the timber you leave a soil so fertile, and so adapted to all kinds of crops grown in the temperate zone, that according to the census of 1880 the cash value per acre of her farm products exceeded that of any other state in the Union except Louisiana. (I have not consulted the census of 1890, for the reason that I know from personal experience that in this respect it is utterly worthless so far as the south is concerned.)

18. Her fruits, and especially her apples, have taken off the first premiums in all the great expositions, and all her prize apples are seedling, showing that it is her soil and climate which produce them.

19. Her cotton, both long and short staple, carried off the premiums at the World's Fair, over the whole world.

20. I do not see how her climate could be improved, in the greater portion of the state.

21. She has established one church nearly every other day for the past ten years, until she has one church for every 325 inhabitants, and still the good work goes bravely on.

22. She has one public school to every 291 people, and one college or seminary to every 22,000 people.

The average death rate per one thousand is 1.23 less than that of the United States, and 1.95 less than that of the northern states, by the census of 1890, and growing less as our states develops.

If we confine the comparison to our hill lands it is believed to be less than in any state in the Union; while our birth-rate beats all creation.

The social condition of Arkansas will compare favorably with that of the best communities in the United States.

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We have erected one and one-quarter school houses every day for the past four years, until we have one school house to every two hundred and ninety-one inhabitants.

Volume 1, Number 11, pages 5 and 7 of the last census says that Arkansas is educating a larger per cent, not only of her white children, but of her colored children, than Maine, New Hampshire, Connecticut, Rhode Island, Massachusetts, New York, New Jersey and Pennsylvania are educating of their own sons and daughters.

Her political situation may not inaptly be described by the word quiescent, since the repeal of the federal election law has removed all fear of another reconstruction revel. The apathy shown in the recent congressional election is unprecedented. In many places not more than 15 per cent of the vote was cast. Sectionalism is dead in Arkansas.

Her industrial condition is fairly good, but infinitely behind what her wonderful resources would warrant It is confidently believed by those conversant with our state that there is not an equal area on the American continent offering so many openings to profitable investment of capital as does Arkansas This is especially true as to our zinc and coal and marl and bauxite fields.

Our zinc took the premium at the World's Fair over the world as to quality, and is inexhaustible in quantity. Dr. Branner, state geologist, now professor of geology in Stanford University, California, says much of our zinc is within one per cent of theoretically pure zinc ore, and has less than one-third of one per cent of iron, thus increasing its value. It is also much more easily mined than the zinc of Missouri, because it is in mountain sides, but it is seventy-five miles from any railroad, and therefore undeveloped. Our coal field is also valuable and extensive. We have four kinds of marl—Greensand, lime, chalk and gypsum within an area of thirty miles square, of which Prof. Branner and R. T. Hill, geologists, say: "These facts alone, if

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properly utilized, will be of greater value to the state than all the gold dug within the bounds of California have been to that state."

We are discovering new resources almost every month.

Within the past six months we have discovered unsuspected deposits of manganese, mica, bauxite, slate and kaolin, of great value and in immense quantities.

During the recent panic we had no bank failures, and if any others they were so insignificant as to have escaped my memory.

Arkansas offers a rich harvest to capital and ideal homes to the immigrant.

Prof. J. C. Branner, state geologist, now in Stanford University of California, reports to the governor: "I beg to say that the analyses I have made of Arkansas zinc ores show them to be high grades, theoretically pure zinc blende, which is but rarely if ever found, contains 67 per cent of zinc, and the high grade Missouri concentrates contains only 62 per cent of zinc. Here are some of the analyses of the Arkansas zinc blende ores, taken at random:

Per cent zinc	66.0	64.0	65.0	65.0	66.0	65.0	66.0
Per cent iron	0.39	0.26	0.62	0.15	0.15	0.15	0.15

Average zinc, per cent, 65.25.

Average iron, per cent, 0.32.

I mention the iron because the low percentage of it increases the value of the zinc ore, and because an ore having 5 per cent or more of iron is considered inferior."

Yours, with respect,

J. C. BRANNER."

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RAILROAD LANDS.

In this connection it may not be out of place to briefly review the great work of the Land Department, St. Louis, Iron Mountain & Southern Railway Company, in the interest of immigration to the state during the past two years.

Commencing with the World's Fair exhibit at Chicago 1893, the ingenuity of the printer and lithographer has been taxed to keep something new before the people of the country in the way of attractive and instructive advertising. More than 200,000 pamphlets were issued and judiciously distributed by this company from the state building at Chicago, the expense of which exceeded the sum of $10,000.

A more recent example of progressive work in this direction is the display in the Land Department at the St. Louis Exposition now just closed. During the six weeks of this Exposition the Land Department maintained at its own expense, a large exhibit of fruits, vegetables, grains, grasses, minerals, etc., which have called forth exclamations of wonder and delight from hundreds of thousands of visitors who have seen them. They have also distributed more than 100,000 descriptive pamphlets and documents advertising the state.

As a matter of further information I am permitted through the courtesy of Land Commissioner G. A. A. Deane, (the right man in the right place for his company, and for Arkansas as well,) to give below the unsold acreage of railroad lands in the several counties penetrated by the Iron Mountain line and branches, as follows, to-wit :

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ST. LOUIS, IRON MOUNTAIN & SOUTHERN R'Y.

COUNTIES.	ACRES.
Clay	41,829
Randolph	17,820
Greene	36,353
Lawrence	21,352
Sharp	1,458
Jackson	30,055
Craighead	8,716
Independence	29,727
White	81,778
Woodruff	2,787
Cleburne	5,282
Faulkner	17,043
Lonoke	8,586
Prairie	4,429
Pulaski	46,594
Saline	84,629
Hot Spring	84,654
Grant	40,500
Jefferson	162
Garland	36,839
Clark	57,122
Dallas	29,711
Nevada	31,202
Ouachita	3,824
Pike	20,250
Hempstead	52,359
Howard	2,884
Lafayette	9,008
Little River	17,985

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LITTLE ROCK & FORT SMITH RAILWAY.

COUNTIES.	ACRES.
Pulaski	29,000
Faulkner	44,000
Saline	2,480
Perry	64,000
Conway	54,400
Yell	32,300
Pope	60,800
Logan	41,800
Johnson	70,400
Franklin	60,800
Sebastian	4,200
Crawford	52,000
Van Buren	10,800

COAL PRODUCTION IN THE STATE FROM JUNE 30, 1893, TO JUNE 30, 1894.

SEBASTIAN COUNTY COAL MINES.

Number of mines, 25.

Kind of coal, bituminous.

Average thickness of vein, 4 feet 4 inches.

Production for the year ending June 30, 1894, 504,106 tons.

Mines worked, 161 days.

JOHNSON COUNTY COAL MINES.

Number of mines, 12.

Coal, bituminous and semi-anthracite.

Thickness of vein, 3 feet 18 inches.

Total production for year ending June 30, 1894, 133,980 tons.

Mines worked, 191 days.

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OPERATORS.	P. O. ADDRESS.	Production. Tons.	VALUE AT MINE.	Number Employed.
Western Coal & Mining Co	Jenny Lind	225,206	$337,809	425
E. B. Petty	Jenny Lind	12,000	18,000	30
P. McMillen	Jenny Lind	14,000	21,000	30
Chas. Peterson	Jenny Lind	6,500	9,250	10
Kansas & Texas	Huntington	200,400	300,600	400
Greenwood Coal Co	Greenwood	2,000	3,000	20
Montreal Coal Co	Montreal	4,000	6,500	20
All others		40,000	60,000	
		504,106	$755,659	935

NOTE—The strip mines are included in "All others," and give employment to about 200 men and quite a number of teams.

OPERATORS.	P. O. ADDRESS.	Production. Tons.	VALUE.	Number Employed.
Western Coal & Mining Co	Coal Hill	73,486	$110,229 00	200
Ouita Coal Co	Coal Hill	26,837	40,255 50	100
Stewell Coal Co	Spadra	26,657	39,980 50	100
Black Diamond	Coal Hill	1,000	2,000 00	12
Montana mine	Spadra	3,000	4,500 00	25
All others		3,000	4,500 00	25
		133,980	$201,465 00	467

FRANKLIN COUNTY.

Number of mines, 3.

Coal, bituminous.

Thickness, 4 feet 4 inches.

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OPERATORS.	P. O. ADDRESS.	Production. Tons.	VALUE.	Number Employed.
Western Coal & Mining Co	Denning	42,778	$64,167	150
Two places worked to supply local trade				40

POPE COUNTY COAL MINES.

Number of mines, 11.

Kind of coal, semi-anthracite.

Thickness of coal, 27 inches.

From June 30, 1893 to June 30, 1894 mines worked 90 days.

OPERATOR.	P. O. Address.	Production Tons.	Value.	No. Employed.
Ouita Coal Co	Ouita	20,000	$ 60,000	100
Broadwell Coal Co.	Russellville	3,500	10,500	45
Burns Mine	Russellville	6,494	19,482	35
Carey Coal Co	Russellville	5,000	15,000	60
Russellville Coal Co.	Russellville	10,000	30,000	45
Gana & Co	Russellville	2,000	6,000	25
All others		4,000	12,000	50
		50,994	$ 152,982	360

NOTE.—All coal mined in this county is semi-anthracite, used only for domestic purposes; causing an almost entire suspension of mining during the summer months.

The total production of the state for the year ending June 30th, 1894, was 731,860 short tons, giving employment to 2,147 men and boys. Using 18,000 kegs of powder, there have been but two fatal accidents in the mines of the state this year; but the number of non-fatal accidents amounted to 37. There were six new mines opened

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in the state in the past year, which will greatly increase the coal production in the near future. There have been five new ventilating fans erected and a number of old ones repaired. The mines are all in a good healthy condition, and many improvements are being made under ground. The coal strike which spread through all the mines in the United States, and in which Arkansas miners joined, caused the miners of this state a direct loss of $100,000 in wages, it continued for thirty days; there were 1,400 Arkansas miners engaged in it.

HARRY MCMULLEN,
State Inspector.

TOBACCO FARMING.

(Paper kindly furnished by I. W. G. Wierman, of Little Rock, Ark.)

In preparing this article on tobacco farming for cigar purposes, I shall be as brief as the subject admits, and will commence it with the preparation of the

SEED BED,

Which always should face south or southeast, and, for convenience, be made on the land intended for the growth of the tobacco. Burn brush in heaps—rake the ashes in the soil, and when thus prepared, sow the seed. The seed should not be raked in the soil, but a plank should be laid on the bed and walked over, backward and forward, and then turned over and the process repeated till the seed in the whole bed has thus been pressed down. Any time after the first of January, when the soil is in good working order, is proper for the sowing of the seed. Tobacco is a weed, and will endure considerable frost, but a better plan is to cover the bed with a sheet during frosty nights. The chief object of the planter should be to have his plants early. Sprinkle your plants with ammonia, dissolved in water, and they will be stimulated to a growth that will insure early transplanting.

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Set out the plants in April, the earlier the better, when the condition of the weather will permit it. Havana seed usually mature in ninety days. In this climate (I speak for Arkansas) the plants can be set out early enough to ripen before worms will have made their appearance. In Arkansas it is no more work to cultivate five acres than it is in Wisconsin or Pennsylvania to cultivate the half of that. The seasons being later in those states, the worms will attack the plants at an earlier stage of growth, and the farmer is obliged to fight them from the time they appear till the crop is cut.

An early crop of tobacco has many advantages. April, May and June are the most favorable months for its growth, while later, droughts and the worms keep it back, injure and destroy it. Matured early, it is also worth more to the manufacturer; it will make more pounds to the acre, and will sell for a higher price in any market.

1832 I had in Saline county fifteen acres planted to tobacco. No finer crop ever grew on American soil. Going over the whole field I found three worms—that was on the 15th day of June. Not until some time in June did the worms become troublesome. For this reason I advise planting in April so that the crop ripens and may have been harvested before the worms become troublesome.

SOIL.

Any soil naturally rich with admixture of sands which admits of drainage, facing the east or southeast will grow tobacco. Any piece of land that you would consider A No. 1 for vegetables is good for tobacco—so it does not face the west. Tobacco will grow on new land, *but its quality is very inferior.* To have perfection, take land that has been in cultivation for some time, prepare it, as you would a piece of ground for vegetables, manure it in the hill, if you have not enough manure to broad-cast it, and you will have the best results. Wood ashes are a splendid fertilizer.

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THE ROWS.

Should be three feet apart, and the Havana seed plant not being as large as other varieties, should be set two feet apart in the rows. Draw a furrow with a "bull-tongue" plow every three feet; then take a light turning-plow and turn over soil on either side of the furrow; then take a "scrapper" and smooth off the rows and it is ready

TO SET OUT THE PLANTS.

A stick two feet long should be used to measure the distances between the plants, and, if sharpened at one end, will do well to make the holes to set in the plants. Nearly level culture is the best. High ridges are objectionable. Use a three-tined fork to draw the plants from the bed, and do not set the plants deeper in the furrows than they were in the bed, taking care not to have the roots doubled up. The best time to set out plants is before a rain.

CULTIVATING THE PLANTS.

No crop is more grateful in its nature for labor bestowed on it than tobacco. Stir the soil after a rain. Tobacco requires not less than three good hoeings. Cultivate it as you would a favorite vegetable, whenever it needs it most, avoid making high ridges and hills, and you will have the best return.

TOPPING.

The tobacco plants should be topped before they blossom. How high, or how low to top, depends on the season. All things favorable, the top should be cut above the eighteenth leaf from the ground.

SUCKERING

Will be necessary soon after topping. All suckers should be pulled before they are three inches long, so that all the nourishment will go into the leaves. In growing seasons, a second crop of suckers will start and grow, which, like the first, must be pulled off.

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PRIMING.

Some people pull off as many as four leaves below, called "priming." This is wrong. Do not willfully pull off a leaf; let all grow. The plant needs these leaves to prevent the sun from drying out the ground around its roots, and to protect the good leaves above against the splashes of dirt from below when it rains.

EVIDENCE OF RIPENESS.

When the leaves assume a mottled appearance; when a tinge of yellow over the leaves is perceptible; when, by doubling a leaf and pressing the crease between your thumb and finger, it breaks, or cuts clean in the crease, the tobacco should be cut.

CUTTING TOBACCO

Is best performed with a hatchet, about ten inches above the ground. Cut into the stock to the heart, then split down through the middle of the stock to within three or four inches of the ground, turn up all the leaves and hack off the stock close to the ground. Of the many ways, this is the quickest and best. The stocks are then hung on laths to the number of from four to seven, depending on their size. The laths may be either rived or sawed. If sawed, they should be 3-8 by 1 3-4 inches by four feet long. If rived, they should be a little thicker, as they are more apt to warp. When thus strung on laths, they should be laid in heaps for the wagon to gather them and take them to the shed prepared for hanging them up, The best time to cut tobacco is after three o'clock. If tobacco is cut on a hot day and allowed to lie in the sun for fifteen minutes, *it is burned.* A sunburn and frost-bite are alike an injury.

HOUSING TOBACCO.

Laths of tobacco should not be hung closer than from twelve to fifteen inches together. As tobacco wilts or cures

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on the poles, the laths can be moved closer together, to make room for more.

THE SHED OR BARN

Is a very important adjunct to the business. Without barn room, tobacco, after grown, can not be taken care of. Therefore it is as necessary to prepare room in time, as it is to have your plants in time. There must be means of ventilation. Eight out of every nine pounds of green tobacco will pass off in evaporation. If this evaporation can not take place the tobacco will be greatly damaged in quality. Many a building on the farm can be utilized for the purpose, but a

MODEL TOBACCO BARN

Should be twenty four feet wide, forty-eight feet long, walls fourteen feet high, comb roof, three ventilators—equal distance from eaeh other—on top of roof. Divide the width of the building into three parts of eight feet each; each extending the entire length of the building and reaching from ground-floor to roof. The division is formed by putting up two lines of posts, four feet apart from center to center, the length of the building; posts resting on rock base and fastened to rafters of roof. Nail on 1 x 3 lumber againsts the posts; the first piece about four feet from the ground, and thus continue to the top. Across these slats, which are four feet apart, the laths, with tobacco on, are hung. But let the slats of the middle section be movable—don't nail them to the posts. Through this middle section your team and wagon passes. After the side sections, and all over head is filled with tobacco, you fix the slats across the middle section, and commence to fill it in about its center. By this means you have the convenience of driving through the barn to fill it, excepting the lower tiers of the drive-way. The joints of the boxing used should be open a full inch.

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HANGING THE TOBACCO.

Great care must be taken that the laths are sufficiently far enough apart to insure proper ventillation. The tobacco on the laths in its green state, must not touch the tabacco on another lath. If it does, it will damage, and it is known on the market as "pole-burned."

STRIPPING TOBACCO.

When the tobacco has hung a sufficient time to dry when all the sap has evaporated; when the stem of the leaf will break, by bending, as a pipe stem will break, then it is ripe to strip.

For stripping, our climate is most favorable. Tobacco has a strong affinity for moisture. However dry it may be during the day, tobacco over night will absorb sufficient moisture to strip off the leaves. In the morning when it is found that the tobacco is moist, as many laths of tobacco should be taken down and bulked, as can be stripped during the day—straw or newly cut grass when damp is a good cover for the tobacco when taken down to keep it in good condition to strip. A tobacco plant has about sixteen leaves. The lower leaves of a plant are known as ground leaves. The upper leaves are called wrappers. But amongst these there are some that are damaged from some cause or other, and not fit for wrappers. In stripping, therefore, three grades of tobacco are usually made.

1. The ground leaves.
2. The wrappers.
3. The leaves, above the ground leaves, but not good enough for wrappers.

From 12 to 16 leaves form a hank. You take a sound ground leaf and tie up that number of leaves and this constitutes a hank. Proceed thus: Put your hanks of ground leaves in a pile; your hanks of wrappers in a pile; your hanks of unsound wrappers, or seconds, in a pile from day

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to day and bulk down each kind by itself; take good care that the tobacco does not dry out; pack it in boxes or cases, then nail them up ready for market.

HAVANNA SEED TOBACCO.

For cigar purposes, will bring a higher price than any other variety.

NOTE.

This article on tobacco farming as before remarked relates to the kind raised for cigar purposes only and must net be confounded with the kind used for chewing and pipe smoking.

To cure the former no fire is used—atmosphere alone, within a limited period of time, accomplishes the curing process.

DIVERSIFIED FARMING.

At this critical, though as we think auspicious time, in the history of agriculture in the south, when "King Cotton" is dethroned and Wheat can scarcely bear transportation charges, it behooves our people to put their heads together and devise some ways and means to change our system of farming.

Diversified farming, both as to field crops and live stock, is the only practical solution of the difficulties that now confront the agriculturist of Arkansas.

The adaptation of our soil, and the great variety of our products in different sections of the state, are such that no one system will work equally well in every locality. Climate, character of soil and altitude must be taken into account with many of our products. Therefore, we advise the organization of farmers' clubs in every county at least, in the state, with frequent meetings for the interchange of ideas and experiences. No one man knows it all. Indeed, from experience, each one of us can know but little, but in

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large numbers, much experimental knowledge may be found. Theory and science are valuable helps, no doubt, but, after all, *experience* is the only reliable guide.

We must not forget, however, changes, especially such radical ones as some of our farmers must make, should be made with great caution, after thorough investigation. It will not be good business judgment, because hogs and corn bring good prices now, for all of us to embark in these enterprises alone. The thing to do, in my judgment, is for every farmer in this state to undertake to grow an abundance of every product consumed on his farm, for man and beast. *First make a living.* If you succeed in this, the profits will come in due season. There are a few products specially adapted to our soil and climate we wish to call attention to. Fruit growing in Arkansas is no longer an experiment. This industry we commend to every section of the state. We do not mean that all varieties will do well everywhere, but many kinds grow to perfection anywhere in the state. So that fruit-growing may be made profitable in every county in the state.

Also, we advise growing melons for the northern market, especially where convenient to transportation. The southern and southeastern portions of the state are well adapted to growing a very early crop of melons.

LATE, OR FALL, IRISH POTATO CROP.

Everybody in Arkansas may raise Irish potatoes in great abundance in the spring, but to grow a fall crop is not so easy.

The fall, or second crop, should be planted from July 1 to August 15, according to location and altitude. The ground should be thoroughly prepared and friable; well fertilized with well-rotted compost or cotton seed meal, and planted five to six inches deep, as near level culture as possible (as this mode retains the moisture better than ridges), about 18 inches apart; rows, two and a half feet apart.

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After planting, the ground should be stirred frequently but not deep.

The greatest difficulty is in obtaining a stand at this season of the year.

Mr. A. W. Poole, manager of the Poole fruit farm, Franklin county, who is a large and successful grower, insists that every potato, however small, should be cut, for fall planting, to insure germination.

The Arkansas experimental station at Camden experimented in 1893 by planting the whole potato, in drills, and by bedding out the potato, as you would sweet potatoes; covering five to six inches deep in July, and watering the bed until the slip appears; then transplanting the slips. This method succeeded in securing a perfect stand; besides, the yield was greater per acre than by the usual method of planting the potato.

Whatever will best overcome the difficulty of obtaining a good fall stand is the plan to adopt.

One acre in Irish potatoes will yield, in value, fully as much as six acres in cotton. A very early crop, for the northern market, and a fall crop, may be depended on as very profitable crops for this state.

The sweet potato is another profitable crop we grow to perfection, and of the finest quality

Again, sugar cane (ribbon cane) may be grown profitably in at least one-half of the state, while sorghum may be successfully raised in every county in the state. Truck farming in Arkansas has proved quite profitable wherever pursued with proper intelligence and persistency.

The question of transportation rates, has been our only obstacle, but by co-operation of planters in each neighborhood, the products may be grown in sufficient quantities of a kind, to ship in carload lots at reduced rates.

This bureau stands ready and anxious to encourage in every way possible any and all feasible plans looking to

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diversity of farm products in the state. The commissioner has been, and will continue to meet any convocation of farmers at any time and place agreed upon, and discuss these matters, with a view of bringing about a change in our system of farming.

The question of seed is a very important concern to every farmer. We have distributed all the seed of reliable kinds we have been able to obtain, and have filed application with the department of agriculture at Washington for a supply, which will be distributed in season.

Let me again insist upon the organization of these "Farmers' Clubs" everywhere, and a uniform, intelligent and persistent effort to diversify our crops.

WORLD'S FAIR AT CHICAGO.

Arkansas may justly take pride in her World's Fair record. With an appropriation of $15,000 only, she made such a creditable exhibit of her resources and skill in the arts that she carried away fifty-eight first awards.

Eight of these awards were on our fruits, the exhibit of which was in charge of the commissioner of this bureau. The display of apples was very attractive indeed. During the fair we exhibited three hundred and seventy-five varieties of apples, one hundred and twenty-five of which were seedlings and unknown varieties. We also received first awards on long and short staple cotton. First award on zinc. Forty-one awards on public school work, and six awards on works of art. Under the circumstances we regard this a good showing for the state. This exhibit of our resources has awakened such an interest in our state that for the year ending December 1st, 1894, at least $5,000,000 have been invested by homeseekers and capitalists in our lands alone. And still there is room.

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DISBURSEMENTS OF THE BUREAU OF MINES, MANUFACTURES AND AGRICULTURE FROM APRIL 1, 1893, TO OCTOBER 1, 1894.

Current expenses including labor and office supplies	993 95
Traveling expenses	300 00
Postage	258 60
Printing	131 45
Millet seed	122 55
Exhibits, collecting same, freights and express..	2,514 00
	$ 4,320 55

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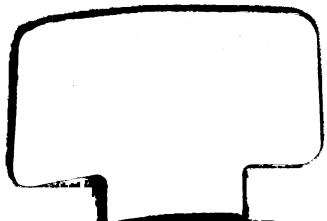
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